

HVAC GENERAL NOTES

- ALL WORK AND MATERIALS SHALL BE PURCHASED AND INSTALLED IN ACCORDANCE WITH ALL NATIONAL & NEW YORK STATE CODES (AS WELL AS ALL APPLICABLE LOCAL CODES & REGULATIONS). THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL HVAC WORK IS PROVIDED AND INSTALLED IN STRICT ACCORDANCE WITH SEISMIC REQUIREMENTS.
- THE EXACT MOUNTING HEIGHTS AND LOCATIONS OF ALL HVAC EQUIPMENT SHALL BE FIELD VERIFIED AND COORDINATED WITH ALL OTHER MECHANICAL, ELECTRICAL, PLUMBING, FIRE SPRINKLER, ARCHITECTURAL AND STRUCTURAL SYSTEMS. DURING SHOP DRAWINGS SUBMISSIONS, SHOW ALL MOUNTING HEIGHTS OF DUCTWORK, UNITS, ETC.
- THE FINISH AND COLOR OF THE AIR DEVICES, AND ALL OTHER EXPOSED HVAC EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECT.
- VERIFY ALL EQUIPMENT VOLTAGES WITH THE ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.
- ELECTRICAL CONTRACTOR WILL PROVIDE DISCONNECT SWITCHES FOR ALL HVAC EQUIPMENT INCLUDING WEATHERPROOF UNITS AS REQUIRED. UNLESS UNITS ARE SPECIFIED WITH FACTORY MOUNTED & INSTALLED DISCONNECT SWITCHES, REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR EXACT DETAILS.
- PROVIDE PHASE LOSS PROTECTION FOR ALL POLY-PHASE MOTOR DEVICES.
- THE FINAL LOCATION OF AIR DEVICES MUST BE COORDINATED WITH THE REFLECTED CEILING PLAN AND ALL OTHER MECHANICAL, ELECTRICAL, SPRINKLER, ARCHITECTURAL, AND STRUCTURAL SYSTEMS.
- DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL IN STRICT COMPLIANCE WITH THE LATEST EDITION OF THE ASHRAE 90.1 AND SMACNA GUIDE RECOMMENDATIONS. ALL DUCTS TO HAVE PITTSBURGH TYPE LOCK FOR LONGITUDINAL SEAMS AND DRIVE SLIP / "S" SLIP FOR TRANSVERSE JOINTS. "DUCT-MATE" JOINT SYSTEM IS ACCEPTABLE IN LIEU OF PRIOR SEAM SYSTEMS. SIZES AS SHOWN INDICATE INSIDE CLEAR DIMENSIONS OF THE AIR PASSAGE. DUCTWORK SHALL BE FULLY INSULATED AS PER APPLICABLE CODES AND WRITTEN SPECIFICATIONS.
- DUCT SIZES MUST BE VERIFIED FOR CLEARANCES AT THE JOB SITE PRIOR TO FABRICATION. DIMENSIONS MAY BE CHANGED TO ACCOMMODATE CONSTRUCTION AS LONG AS EFFECTIVE CROSS-SECTIONAL AREA IS MAINTAINED. DUCT TRANSITIONS SHALL BE CONSTRUCTED WITH A SLOPE OF 1" TO 4". ALL DEVIATIONS FROM ORIGINAL CONTRACT DRAWINGS SHALL BE REVIEWED BY ENGINEER DURING THE SHOP DRAWING PROCESS.
- PROVIDE ELBOWS OR TEES WITH TURNING VANES FOR ALL CHANGES OF DUCT DIRECTION. PROVIDE SPLITTER DAMPERS WITH LOCKING QUADRANTS IN ALL TEES.
- PROVIDE MANUAL BALANCING DAMPERS AS REQUIRED TO PROPERLY BALANCE EACH INDIVIDUAL AIR DISTRIBUTION SYSTEM. IF THE LOCATION OF THE BALANCING DAMPER IS NOT DEFINED ON THE DRAWINGS, THE FOLLOWING MINIMUM STANDARDS SHALL GOVERN. ALL SUPPLY, RETURN, AND EXHAUST MAIN BRANCHES FROM TRUNKS, EACH SPLIT AND ALL SUB-BRANCHES FROM MAIN SHALL INCORPORATE BALANCING DAMPERS.
- PROVIDE FLEXIBLE CONNECTORS AT ALL DUCT CONNECTIONS TO VIBRATING EQUIPMENT. THESE CONNECTORS SHALL BE INSTALLED IN CLOSE PROXIMITY TO SUCH EQUIPMENT.
- PROVIDE FIRE DAMPERS WITH RATED ACCESS DOORS AT ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS, SMOKE AND FIRE STOPPING, SHAFT, FLOORS, RATED CEILINGS AND PARTITIONS AS REQUIRED TO MAINTAIN ARCHITECTURAL FIRE RATINGS. REFER TO THE ARCHITECTURAL PLANS AND SPECIFICATIONS FOR LOCATIONS AND FIRE RATING REQUIREMENTS. M.C. MUST FULLY REVIEW ALL ARCHITECTURAL AND ENGINEERING DRAWINGS AND VISIT THE SITE PRIOR TO SUBMITTING THE BID. NO EXTRAS WILL BE ALLOWED.
- ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION AREA TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE HVAC CONTRACTOR TO IDENTIFY SIZE, TYPE, LOCATION AND ADDITIONAL FRAMING OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED HVAC LOCATIONS AND FIRE RATING REQUIREMENTS. M.C. MUST FULLY REVIEW ALL ARCHITECTURAL AND ENGINEERING DRAWINGS AND VISIT THE SITE PRIOR TO SUBMITTING THE BID. NO EXTRAS WILL BE ALLOWED.
- ALL WALL AND ROOF OPENINGS 12" X 12" OR LARGER ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE HVAC CONTRACTOR TO IDENTIFY SIZE, TYPE, LOCATION AND ADDITIONAL FRAMING OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED HVAC LOCATIONS AND FIRE RATING REQUIREMENTS. M.C. MUST FULLY REVIEW ALL ARCHITECTURAL AND ENGINEERING DRAWINGS AND VISIT THE SITE PRIOR TO SUBMITTING THE BID. NO EXTRAS WILL BE ALLOWED.
- ALL CEILING MOUNTED EQUIPMENT MUST BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURE WITH COMBINATION SPRING AND NEOPRENE-IN-SHEAR HANGERS AND ROD. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT THE LOAD.
- M.C. MUST CONTRACT AN INDEPENDENT NEBB CERTIFIED AIR BALANCING & TESTING COMPANY TO PERFORM THE AIR BALANCING WORK AND ASSOCIATED SYSTEM AIR BALANCING REPORT. ALL WORK SHALL BE PERFORMED IN STRICT COMPLIANCE WITH ALL APPLICABLE CODES, REGULATIONS, PLANS AND WRITTEN SPECIFICATIONS. SUBMIT THE FINAL AIR BALANCE REPORT TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT. AS DETERMINED BY THE G.C. AND OWNER/CLIENT. THE AIR BALANCE REPORT MUST INCLUDE ALL SUPPLY, RETURN, & EXHAUST AIR TERMINALS, FRESH AIR (OUTSIDE AIR) INTAKE AND VENTILATION EXHAUST CFM RATINGS FOR ALL UNITS. ALSO INCLUDE ACTUAL SUPPLY & RETURN AIR VELOCITY & STATIC PRESSURE READINGS ALONG WITH ALL MOTOR AMPERAGES FOR ALL UNITS.
- IF APPLICABLE, ALL ROOFTOP HVAC EQUIPMENT SHALL BE MOUNTED ON STEEL DUNNAGE, LEVEL AND SUFFICIENTLY AWAY FROM EDGE OF ROOF (MIN. 6 FT). ALL EXPOSED DUCTWORK PENETRATIONS MUST BE PROPERLY FLASHED TO ALLOW FOR A WEATHER TIGHT SEAL. IN ADDITION, ADEQUATE CLEARANCES SHALL BE PROVIDED FOR CLEANING AND MAINTENANCE REQUIREMENTS. THE FINAL LOCATION OF ALL ROOFTOP UNITS MUST ALSO COMPLY WITH ALL OSHA SAFETY REQUIREMENTS. M.C. MUST SUBMIT THE FOLLOWING ITEMS TO THE ENGINEER FOR REVIEW AND APPROVAL: (A) DUCTWORK ROOF PENETRATION FLASHING MATERIAL/METHODS, AND (B) EXACT STRUCTURAL FASTENING MATERIALS, METHODS, LOCATIONS TO PROPERLY SECURE THE ROOF-TOP EQUIPMENT TO THE STEEL DUNNAGE.
- FIRE ALARM CONTRACTOR IS TO PROVIDE DUCT SMOKE DETECTORS WITH AUXILIARY CONTACTS. UPON ACTIVATION THE SMOKE DETECTORS SHALL SHUT DOWN THE AIR DISTRIBUTION SYSTEMS AND ACTIVATE A VISIBLE AND AUDIBLE SUPERVISOR SIGNAL AT A CONSTANTLY ATTENDED LOCATION IN ACCORDANCE WITH NFPA 90A & 90B. THE M.C. IS RESPONSIBLE TO COORDINATE THE INSTALLATION OF THE SMOKE DETECTORS WITH THE FIRE ALARM CONTRACTOR. THE E.C. IS RESPONSIBLE FOR WIRING. THE FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR COMMISSIONING.
- ALL INSTRUMENTATION AND CONTROLS BY CONTROLS CONTRACTOR.
- RIGGING OF NEW EQUIPMENT TO BE SCHEDULED/COORDINATED WITH OWNER REP. RIGGING MUST BE PERFORMED DURING "OFF HOURS" TO ELIMINATE PARKING PROBLEMS. M.C. MUST COORDINATE RIGGING WITH ANY REQUIREMENT MANDATED BY THE LOCAL BUILDING DEPARTMENT AND/OR ANY OTHER AGENCIES INCLUDING SUCH PERMITS, FEES, ETC.
- COORDINATE EXACT LOCATIONS AND VERTICAL ELEVATIONS OF ALL TRANSFER GRILLS AND OPENINGS WITH THE ARCHITECT.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S REQUIREMENTS/SPECIFICATIONS.

MECHANICAL DEMOLITION NOTES

- CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION OF MECHANICAL EQUIPMENT AND MATERIAL RELATING TO THEIR RESPECTIVE TRADE.
- THE CONTRACTOR SHALL REMOVE, RELOCATE, REPLACE, ADJUST, ADAPT AND MODIFY EXISTING EQUIPMENT AND/OR SYSTEMS AS REQUIRED WHEN SUCH WORK IS UNCOVERED AND FOUND TO INTERFERE WITH COMPLETION OF WORK IN THIS CONTRACT OR OTHER CONTRACT WORK.
- THE CONTRACTOR SHALL ABANDON IN PLACE ALL EQUIPMENT AND/OR SYSTEMS AS DEFINED IN THE SCOPE OF THIS CONTRACT.
- EXECUTE THE DEMOLITION IN CAREFUL AND ORDERLY MANNER WITH THE LEAST POSSIBLE DISTURBANCE TO THE PUBLIC, EGRESS OR THE FUNCTIONING OF THE EXISTING BUILDING.
- TAKE NECESSARY PRECAUTIONS TO PREVENT DUST AND DIRT FROM RISING BY WETTING DEMOLISHED DEBRIS. EXCESSIVE USE OF WATER WILL NOT BE PERMITTED.
- PRIOR TO DEMOLITION, CONTRACTOR SHALL REVIEW WITH OWNER ALL MATERIALS TO BE REMOVED. SHOULD THE OWNER WANT TO KEEP ANY MATERIALS THE CONTRACTOR SHALL REMOVE AND DELIVER THE PARTS TO THE OWNER ON THE SITE WHERE SO DIRECTED. OTHERWISE ALL DEMOLISHED OR REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND BE DISPOSED OF IN A LEGAL MANNER.
- DEMOLITION SHALL INCLUDE REMOVAL OF ALL PARTS AND PIECES IN THEIR ENTIRETY BACK TO POINTS INDICATED OR IF NOT INDICATED BACK TO THEIR POINT OF SOURCE.
- WHERE CONDITIONS PROHIBIT TOTAL REMOVAL OF THE WORK, THE REMAINING PORTION SHALL BE CUT FLUSH WITH THE SURROUNDING SURFACE AND BE CAPPED, PLUGGED OR SEALED AND THE SURROUNDING SURFACE SHALL BE REFINISHED IN AN APPROVED MANNER.
- DO NOT REMOVE EXISTING STRUCTURAL WORK. DO NOT REMOVE OPERATIONAL ELEMENTS AND SAFETY-RELATED COMPONENTS IN A MANNER RESULTING IN A REDUCTION OF CAPACITIES TO PERFORM IN THE MANNER INTENDED OR RESULTING IN DECREASED OPERATIONAL LIFE, INCREASED MAINTENANCE, OR DECREASED SAFETY.
- REMOVALS, DISCONNECTIONS, AND RELOCATIONS SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE INVOLVED AND SHALL BE EMPLOYED BY A CONTRACTOR LICENSED IN THE TRADE INVOLVED. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ACCEPTED TRADE PRACTICES.
- PROVIDE ADEQUATE TEMPORARY SUPPORT FOR WORK TO REMAIN, TO PREVENT FAILURE. DO NOT ENDANGER OTHER WORK.
- PROTECTION: PROVIDE ADEQUATE PROTECTION WHERE REQUIRED FOR THE PRESENT BUILDING AND ITS CONTENTS. TEMPORARY DUSTPROOF BARRIERS AND BARRICADES SHALL BE ERECTED WHERE REQUIRED FOR PROTECTION OF PERSONNEL. PROTECTION FROM DUST AND DIRT, FOR SECURITY, FIRE AND WEATHER PROTECTIVE REASONS.
- CONTRACTOR SHALL TAKE EVERY PRECAUTION AGAINST FIRE BY EMPLOYING FIRE DEPARTMENT TYPE HOSES AND PORTABLE FIRE EXTINGUISHERS AS REQUIRED BY OSHA AND/OR THE OWNER'S INSURANCE UNDERWRITER.
- BEFORE STARTING DEMOLITION OPERATIONS, PROVIDE THE NECESSARY PROTECTIVE DEVICES, WHERE REQUIRED, AND IN STRICT ACCORDANCE WITH OSHA RULES AND REGULATIONS.
- ALL EXISTING EQUIPMENT REQUIRED TO BE REUSED SHALL BE CLEANED, RECONDITIONED, CALIBRATED AND ADJUSTED. EXISTING EQUIPMENT SHALL BE ABATED AS DIRECTED IN THE ENVIRONMENTAL DRAWINGS. IN ALL INSTANCES WHERE CONTRACTOR FINDS THAT EXISTING EQUIPMENT IS DEFECTIVE TO THE POINT WHERE IT CANNOT BE PROPERLY RESTORED AND WILL NOT OPERATE PROPERLY, HE SHALL REPORT THE SPECIFIC INSTRUMENTS OR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR DIRECTIONS.
- FIELD VERIFY DEMOLITION REQUIREMENTS AND EXISTING CONDITIONS. DEMOLITION NOTES ARE INDICATED IN NOTE FORM.
- CONTRACTOR SHALL ESTABLISH A PATH OF TRAVEL AND TIME SCHEDULE FOR THE REMOVAL OF ALL DEBRIS AND WASTE, AND HAVE THIS APPROVED BY OWNER. CONTRACTOR IS TO ENSURE THAT ALL CORRIDORS AND PUBLIC AREAS BE KEPT FREE OF OBSTRUCTIONS, DEBRIS, AND ARE TO BE BROOM SWEEP CLEAN AT ALL TIMES.
- CONTRACTOR SHALL VISIT THE SITE AND BECOME INFORMED AS TO THE CONDITION OF THE PREMISES AND THE EXTENT AND CHARACTER OF WORK REQUIRED. NO ADDITIONAL COMPENSATION WILL BE APPROVED DUE TO FIELD CONDITIONS.
- WHERE EXISTING VENTILATION AND AIR CONDITIONING SYSTEMS WILL BE INTERRUPTED TO SPACES AS THE RESULT OF DEMOLITION, IF THE SPACES WILL BE OCCUPIED DURING CONSTRUCTION, CONTRACTOR IS RESPONSIBLE TO PROVIDE TEMPORARY MEANS OF VENTILATION, HEATING AND COOLING. COORDINATE PHASING AND REQUIREMENTS WITH FACILITY OWNER.

CONTROL GENERAL NOTES

- THE NEW EQUIPMENT DDC CONTROLLERS SHALL WORK SEAMLESSLY WITH THE EXISTING LEGACY AND/OVER SYSTEM TO MEET SEQUENCES OF OPERATION. ALL NEW COMPONENTS SHALL BE 100 PERCENT COMPATIBLE WITH THE EXISTING SYSTEM. EXISTING CONTROLS SERVICE BY EMF CONTROLS. CONTACT CHIP GREENWOOD AT GREENWOOD@EMFCONTROLS.COM OR 914-747-1007.
- ENSURE ALL EXISTING EQUIPMENT SEQUENCES AND CONTROLS ARE MAINTAINED UNLESS OTHERWISE INDICATED ON THESE DRAWINGS.
- REVIEW BMS WITH EXISTING SYSTEM MANUFACTURER AND PERFORM ANY REQUIRED SOFTWARE UPGRADES PRIOR TO THE VFD INSTALLATION.
- PERFORM ALL NECESSARY INSPECTIONS AND PERFORMANCE TESTS AFTER INSTALLATION OF VFD TO ENSURE SYSTEM IS OPERATING PROPERLY.
- CONTRACTOR TO COORDINATE SCHEDULE WITH FACILITY PRIOR TO SHUTDOWN OF ANY EQUIPMENT.

HVAC ABBREVIATIONS

IDENTIFIER	DESCRIPTION
AHU	AIR HANDLING UNIT
A.P.D.	AIR PRESSURE DROP
BACNET	BUILDING AUTOMATION AND CONTROL NETWORK
BAS	BUILDINGS AUTOMATION SYSTEM
BC	BOTTOM GRILLE
BHP	BRAKE HORSEPOWER
BMS	BUILDING MANAGEMENT SYSTEM
B.O.D.	BOTTOM OF DUCT
BOT	BOTTOM
BR	BOTTOM REGISTER
BTU/HR	BRITISH THERMAL UNITS/HR
CFM	CUBIC FEET PER MINUTE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CM	CHILLER
COND	CONDENSATE DRAIN
CP	CONTROL PANEL
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
DB	DRY BULB
DES	DAMPER END SWITCH
DA	DAMPER
DN	DOWN
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DTWR	DUAL TEMPERATURE WATER RETURN
DTWS	DUAL TEMPERATURE WATER SUPPLY
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ENVIRONMENTAL CONTROL UNIT
EDB	ENTERING DRY BULB
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EH	ELECTRIC HEATER
ETR	EXISTING TO REMAIN
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
FAI	FRESH AIR INTAKE
FCU	FAN COIL UNIT
FLA	FULL-LOAD-AMPERAGE
FPM	FEET PER MINUTE
FT	FLOW TRANSMITTER
FZ	FREEZE
G	GAS
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HD	HEAD
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HP	HORSEPOWER
HV	HEATING/VENTILATION
IAW	IN ACCORDANCE WITH
LAT	LEAVING AIR TEMPERATURE
MAU	MAKE UP AIR UNIT
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OPNG	OPENING
OP WT	OPERATING WEIGHT
P	PUMP
PD	PRESSURE DROP
PT	PRESSURE TRANSMITTER
QTY	QUANTITY
RA	RETURN AIR
RD	RETURN DIFFUSER
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RPM	ROTATIONS PER MINUTE
RTU	ROOFTOP UNIT
SA	SUPPLY AIR
SCV	SELF CONTAINED CONTROL VALVE
SD	SUPPLY DIFFUSER
SG	SUPPLY GRILLE
SPS	STATIC PRESSURE SENSOR
SR	SAFETY RELAY
TCV	TEMPERATURE CONTROL VALVE
TG	TRANSFER GRILLE
TSP	TOTAL STATIC PRESSURE
TO	TRANSFER OPENING
T.O.D.	TOP OF DUCT
TT	TEMPERATURE TRANSMITTER
TYP.	TYPICAL
UH	UNIT HEATER
UV	UNIT VENTILATOR
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VIC	VIBRATION ISOLATION CONNECTION
VIF	VERIFY IN FIELD
WB	WET BULB
W.C.	WATER COLUMN
WG	WATER GAUGE
WMS	WIRE MESH SCREEN

HVAC SYMBOL LIST

IDENTIFIER	DESCRIPTION	IDENTIFIER	DESCRIPTION
2	AIR VENT		FLAT, PLEATED FILTER
2	PRESSURE GAUGE WITH PETCOCK		CARTRIDGE FILTER
2	THERMOMETER		HUMIDIFIER
2	PIPE RUNOUT UP THROUGH FINISHED FLOOR ABOVE		
2	PIPE DROP ON DIRECTION OF FLOW		
2	PIPE RISER		
2	PIPE TEE DOWN		
2	PIPE TEE UP		
2	TWO WAY AND THREE WAY CONTROL VALVE		
2	BALLISOLATION VALVE		
2	GLOBE VALVE		
2	EXPANSION/RELIEF VALVE		
2	BALANCING VALVE		
2	CHECK VALVE		
2	DRAIN VALVE		
2	FLEXIBLE CONNECTION		
2	DAMPER		
2	UNION		
2	STRAINER WITH BLOW OFF VALVE		
2	TRIPLE DUTY VALVE		
2	THERMOSTATIC STEAM TRAP		
2	CAPPED PIPE		
2	FLOAT & THERMOSTATIC STEAM TRAP		
2	PIPE ANCHOR		
2	PIPE SLEEVE		
2	NEW DUCTWORK OR PIPING TO BE REMOVED		
2	EXISTING DUCTWORK OR PIPING TO REMAIN		
2	HEAT TRACE PIPE		
2	DOUBLE-LINE AND SINGLE-LINE RECTANGULAR DUCT, FIRST NUMBER INDICATES SIDE IN VIEW IN INCHES, SECOND NUMBER INDICATES SIDE IN DEPTH IN INCHES		
2	DOUBLE-LINE AND SINGLE-LINE ROUND DUCT, NUMBER INDICATES DIAMETER IN INCHES		
2	FLEXIBLE DUCTWORK		
2	REGULAR SUPPLY AIR DUCT (UP AND DOWN)		
2	REGULAR RETURN AIR DUCT (UP AND DOWN)		
2	REGULAR EXHAUST AIR DUCT (UP AND DOWN)		
2	REGULAR OUTSIDE AIR DUCT (UP AND DOWN)		
2	ROUND SUPPLY AIR DUCT (UP AND DOWN)		
2	ROUND RETURN AIR DUCT (UP AND DOWN)		
2	ROUND EXHAUST AIR DUCT (UP AND DOWN)		
2	ROUND OUTSIDE AIR DUCT (UP AND DOWN)		
2	INSULATED FLEXIBLE DUCT		
2	VOLUME DAMPER		
2	BACKDRAFT DAMPER		
2	FIRE DAMPER AND ACCESS DOOR		
2	SMOKE DAMPER AND ACCESS DOOR		
2	MOTOR OPERATED DAMPER		
2	CONTROL DAMPER		
2	FAN - CENTRIFUGAL		
2	AIRFLOW MEASURING STATION		
2	EQUIPMENT TAG		
2	EQUIPMENT NUMBER		
2	DETAIL TAG/CALL OUT TAG		
2	MECHANICAL SHEET NUMBER		
2	TAG - BMS DEVICE		
2	XX-DEVICE TYPE		
2	YY-SIGNAL TYPE		
2	ELECTRIC PNEUMATIC RELAY		
2	XX - TAG NUMBER		
2	YYY - SYSTEM		
2	FIELD CONNECT NEW TO EXISTING		
2	DIFFERENTIAL PRESSURE SENSOR		
2	SUPPLY AIR FLOW		
2	EXHAUST AIR		
2	GAS SENSOR (INDICATE TYPE)		
2	UNDERCUT DOOR		
2	THERMOSTAT		
2	DUCT SMOKE DETECTOR		
2	TEMPERATURE SENSOR		
2	4 WAY CEILING DIFFUSER		
2	3 WAY CEILING DIFFUSER		
2	2 WAY CEILING DIFFUSER		
2	2 WAY CEILING DIFFUSER		
2	EXHAUST FAN		
2	EXHAUST GRILLE		
2	METER		
2	REGULATOR		
2	RETURN GRILLE/REGISTER		
2	SUPPLY DIFFUSER - ROUND		
2	RETURN DIFFUSER - ROUND		
2	EXHAUST DIFFUSER - ROUND		
2	SIDEWALL GRILLE		
2	ELECTRONIC TIMECLOCK		
2	REFER TO SUPPLEMENTAL FIGURE INDICATED BY NUMBER (I.E. F2 REFERS TO FIGURE 2)		

PROJECT TITLE

SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
**183 PALMER RD
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MEP ENGINEER AND ENVIRONMENTAL ENGINEER

LiRo Engineers, Inc.
A LiRo Group Company
Sysasset, N.Y. 516-214-8157(T)

KEY PLAN: NOT TO SCALE

SHEET SIZE 30X42

MARK DATE DESCRIPTION

0 08/18/20 ADDENDUM 1

04/17/20 100% CONSTRUCTION DOCUMENTS

03/27/20 90% CONSTRUCTION DOCUMENTS

ISSUE

SED #: 66-23-00-01-0-206-017

YPS JOB: 10881

DESIGN BY: SHB

DRAWN BY: SHB

CHKD BY: SFA

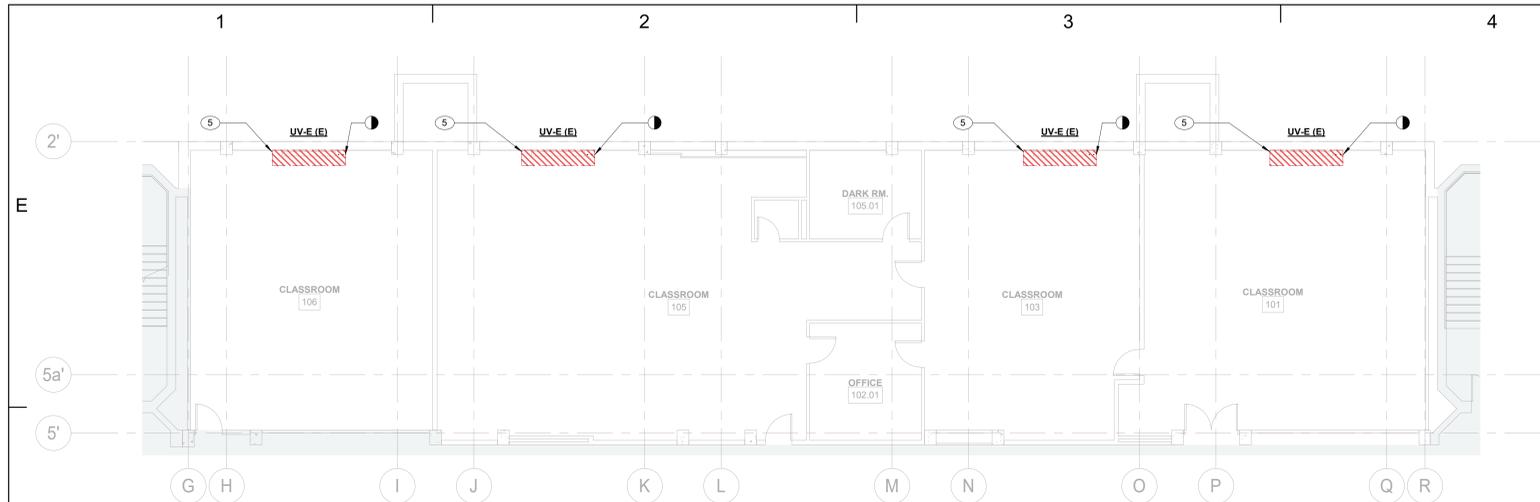
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ENGINEER'S SEAL

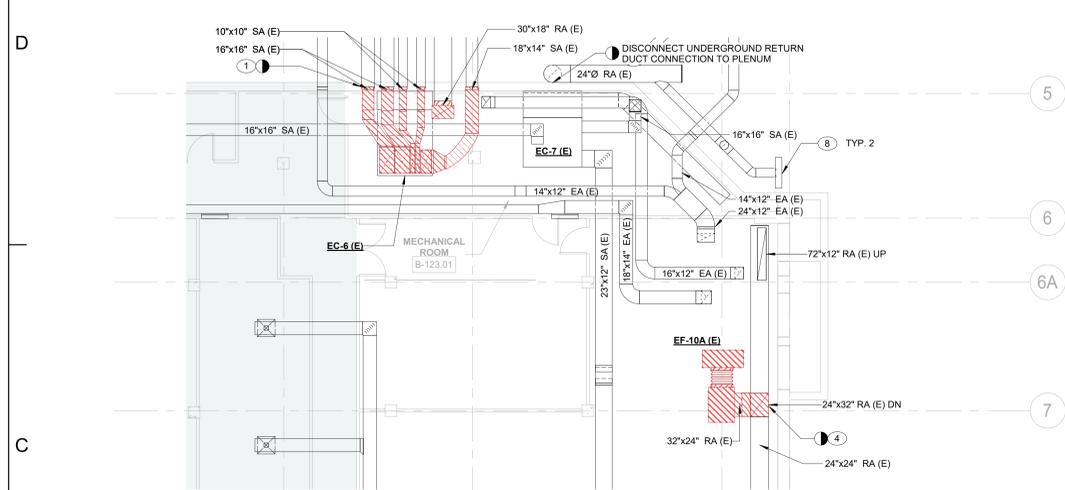
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SHEET TITLE

MECHANICAL NOTES, SYMBOLS, AND ANNOTATIONS

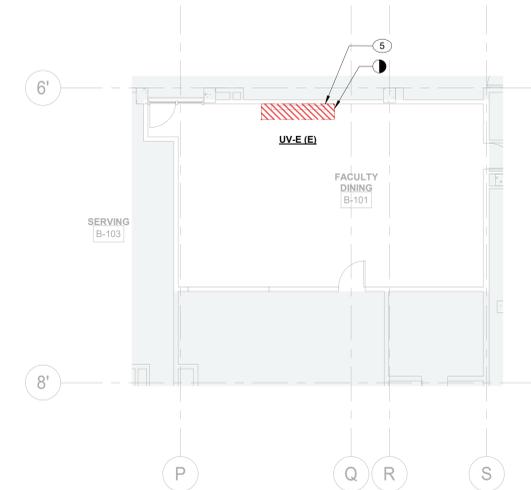
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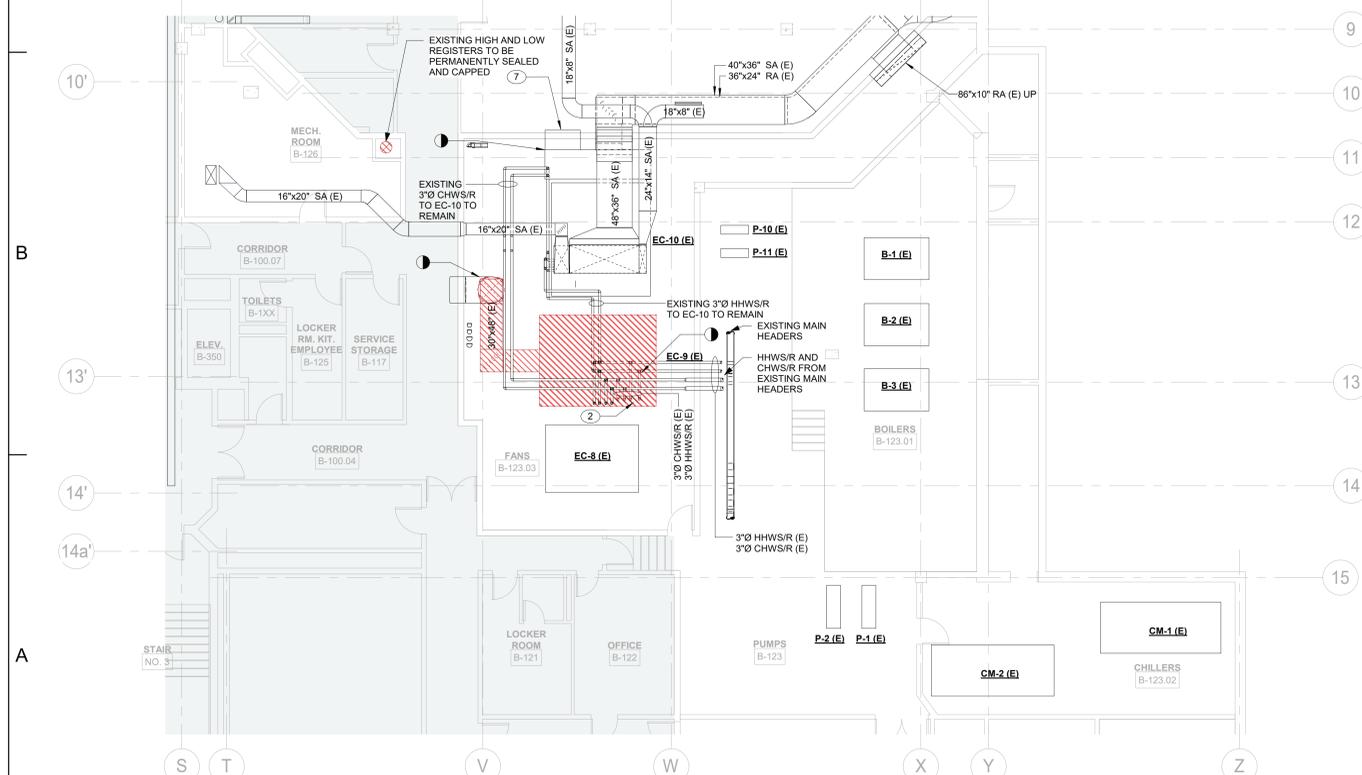
MECHANICAL 1ST FLOOR HVAC CLASSROOM DEMOLITION PLAN



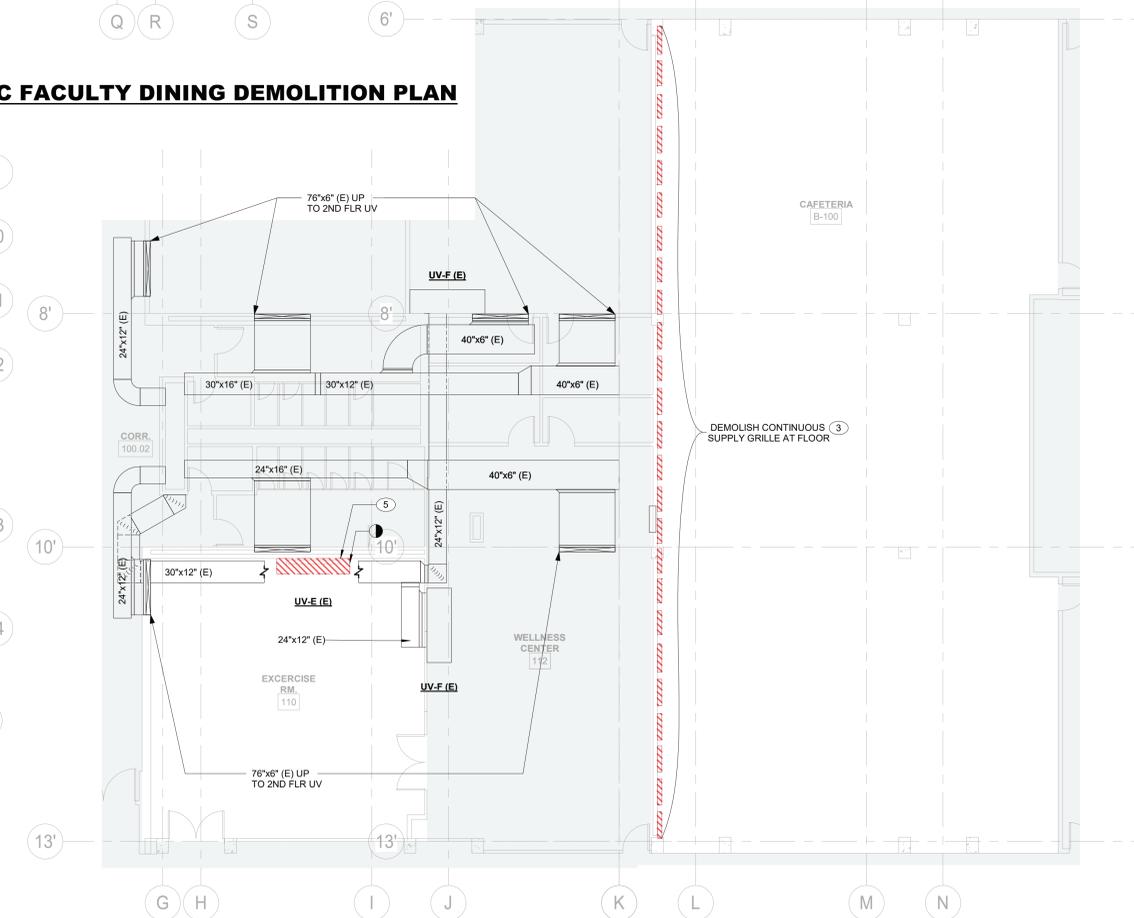
MECHANICAL 1ST FLOOR HVAC MER DEMOLITION PLAN



MECHANICAL 1ST FLOOR HVAC FACULTY DINING DEMOLITION PLAN



MECHANICAL 1ST FLOOR HVAC BOILER RM DEMOLITION PLAN



MECHANICAL 1ST FLOOR HVAC EXERCISE ROOM & CAFETERIA DEMOLITION PLAN

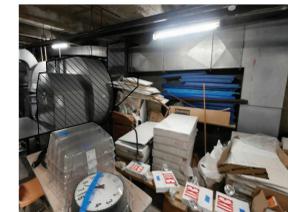


FIGURE 1:
MECHANICAL ROOM EXHAUST FAN
EF-10A



FIGURE 2:
CAFETERIA SUPPLY GRILLE

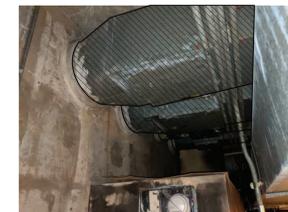


FIGURE 3:
MER ROOM DUCT CONNECTION TO
UNDERGROUND TRANSITE DUCTS

MECHANICAL NOTES:

1. DEMOLISH SUPPLY AND RETURN DUCTWORK FROM UNIT EC-6 TO WALL, WHERE TRANSITION TO TRANSITE DUCT OCCURS. (SEE FIGURE 3 & 4)
2. EC-9 TO BE DEMOLISHED. SUPPLY DUCTWORK TO BE DISCONNECTED AT FLOOR SLAB PENETRATION AND SEALED BY ABATEMENT CONTRACTOR. SEAL UP EC-9 CONNECTION TO OUTDOOR AIR PLENUM. DEMOLISH HEATING HOT WATER AND CHILLED WATER PIPES BACK TO HEADER.
3. CONTINUOUS SUPPLY GRILLES AND PLENUM (SEE FIGURE 2) ALONG CAFETERIA WALL TO BE REMOVED. SUPPLY AIR INTAKE OPENINGS TO BE FILLED AND COVERED BY ABATEMENT CONTRACTOR.
4. DISCONNECT 24x32 EXHAUST FAN CONNECTION FROM 24x24 RETURN MAIN AND PATCH DUCT TO MAINTAIN INTEGRITY OF RETURN DUCT MAIN. EF-10A AND ASSOCIATED 24x32 DUCT TO BE DEMOLISHED. (SEE FIGURE 1)
5. UNIT VENTILATORS TO BE REMOVED. OUTSIDE AIR INTAKE TRING TO BE FILLED AND COVERED. DISCONNECT EXISTING PIPES.
6. CHILLED WATER PUMPS TO BE REPLACED. CUT BACK EXISTING TRING TO ENABLE NEW PUMPS INSTALLATION. MAINTAIN EXISTING INSTRUMENTATION AS MUCH AS FEASIBLE. SEE PHOTO ON M-301.
7. EXISTING 48x24 RETURN DUCT TO EC-10 TO BE DISCONNECTED AND SEALED BY ABATEMENT CONTRACTOR.
8. EXISTING GRILLES (ONE SIDEWALL GRILLE AT SECURITY CLOSET WALL AND ONE FLOOR-MOUNTED GRILLE IN LOBBY) TO BE DEMOLISHED BY MC. EXISTING TRANSITE DUCTS TO BE CUT BACK TO SLAB AND SEALED BY ABATEMENT CONTRACTOR. FLOOR TO BE RESTORED BY GC.

GENERAL NOTES:

1. SEE ENVIRONMENTAL DRAWINGS FOR GC AND REMEDIATION CONTRACTOR SCOPE TO CAP AND SEAL ABANDONED DUCTS.
2. UNDERGROUND DUCTS CONNECTED TO EC-6, 7, 9, AND 10 TO BE ABANDONED IN PLACE.

PROJECT TITLE

**SAUNDERS TRADES
AND TECHNICAL
HIGH SCHOOL HVAC
UPGRADES**

PROJECT ADDRESS

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MEP ENGINEER AND ENVIRONMENTAL ENGINEER

LiRo Engineers, Inc.
A LiRo Group Company
Syosset, N.Y. 516-214-8157(T)

KEY PLAN: NOT TO SCALE

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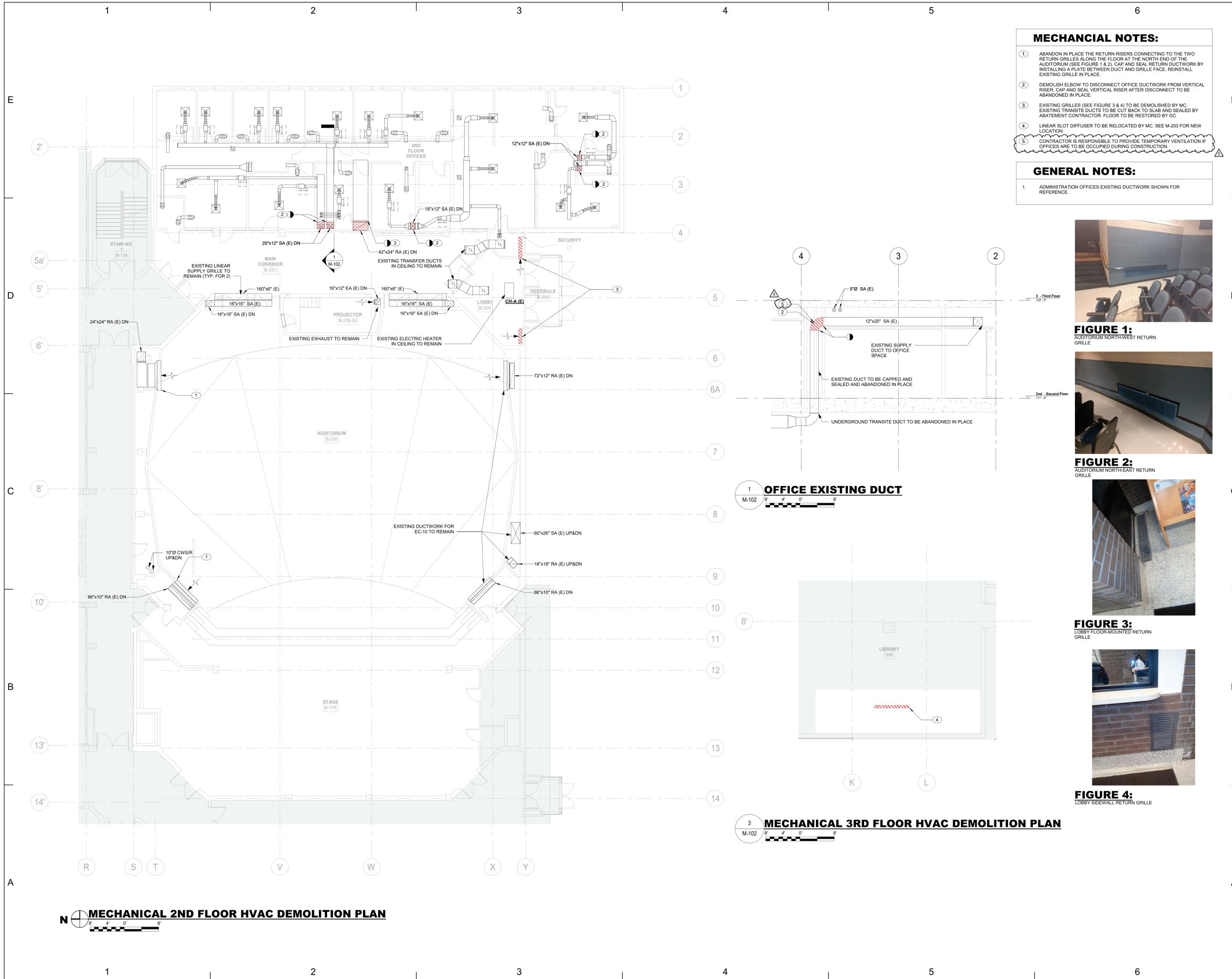
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**MECHANICAL 1ST FLOOR
HVAC DEMOLITION PLAN**

M-101



- MECHANICAL NOTES:**
1. ABANDON IN PLACE THE RETURN RISERS CONNECTING TO THE TWO RETURN GRILLES ALONG THE FLOOR AT THE NORTH END OF THE AUDITORIUM (SEE FIGURE 1 & 2). CAP AND SEAL RETURN DUCTWORK BY INSTALLING A PLATE BETWEEN DUCT AND GRILLE FACE. REINSTALL EXISTING GRILLE IN PLACE.
 2. DEMOLISH ELBOW TO DISCONNECT OFFICE DUCTWORK FROM VERTICAL RISER. CAP AND SEAL VERTICAL RISER AFTER DISCONNECT TO BE ABANDONED IN PLACE.
 3. EXISTING GRILLES (SEE FIGURE 3 & 4) TO BE DEMOLISHED BY MC. EXISTING TRANSITE DUCTS TO BE CUT BACK TO SLAB AND SEALED BY ABATEMENT CONTRACTOR. FLOOR TO BE RESTORED BY GC.
 4. LINEAR SLOT DIFFUSER TO BE RELOCATED BY MC. SEE M-203 FOR NEW LOCATION.
 5. CONTRACTOR IS RESPONSIBLE TO PROVIDE TEMPORARY VENTILATION IF OFFICES ARE TO BE OCCUPIED DURING CONSTRUCTION.
- GENERAL NOTES:**
1. ADMINISTRATION OFFICES EXISTING DUCTWORK SHOWN FOR REFERENCE.

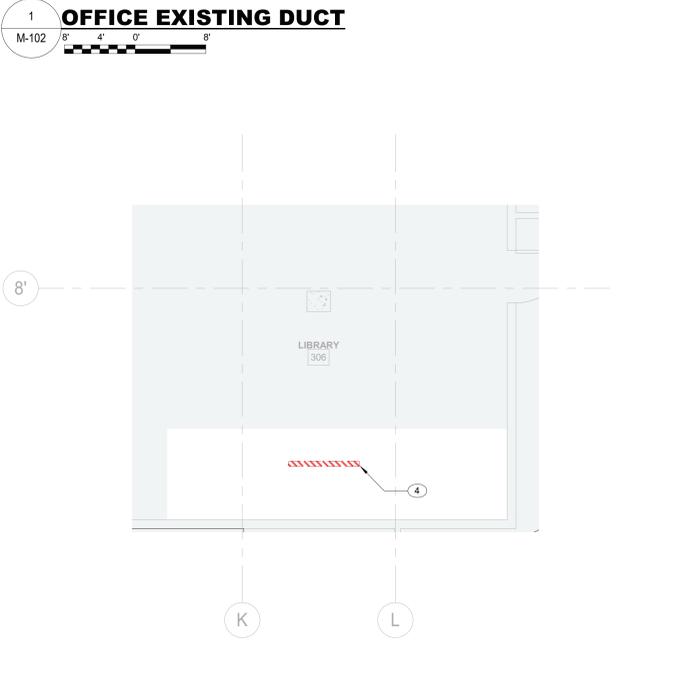
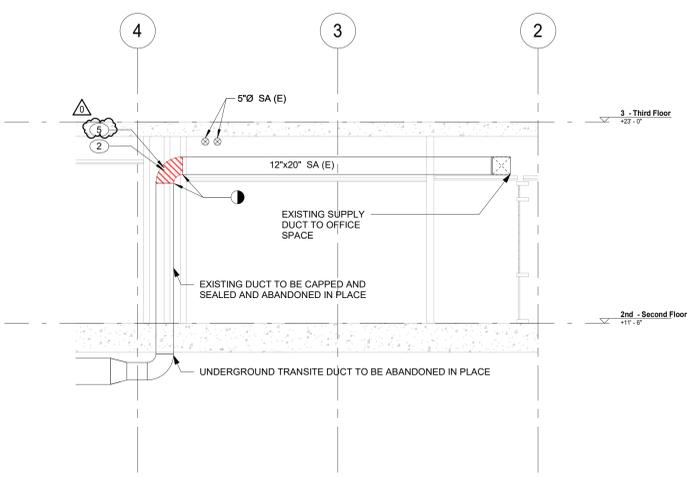


FIGURE 1:
AUDITORIUM NORTH-WEST RETURN GRILLE



FIGURE 2:
AUDITORIUM NORTH-EAST RETURN GRILLE



FIGURE 3:
LOBBY FLOOR-MOUNTED RETURN GRILLE



FIGURE 4:
LOBBY SIDEWALL RETURN GRILLE

PROJECT TITLE
SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
**183 PALMER RD
YONKERS, NY 10701**

OWNER
YONKERS PUBLIC SCHOOLS

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Syosset, N.Y. 516-214-8157(T)

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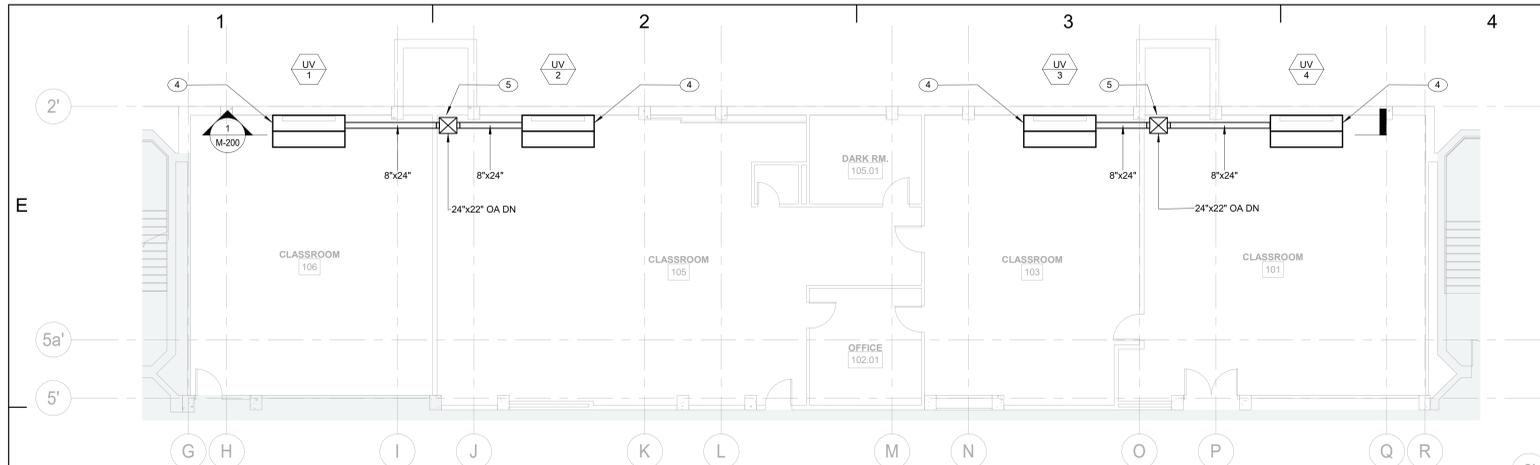
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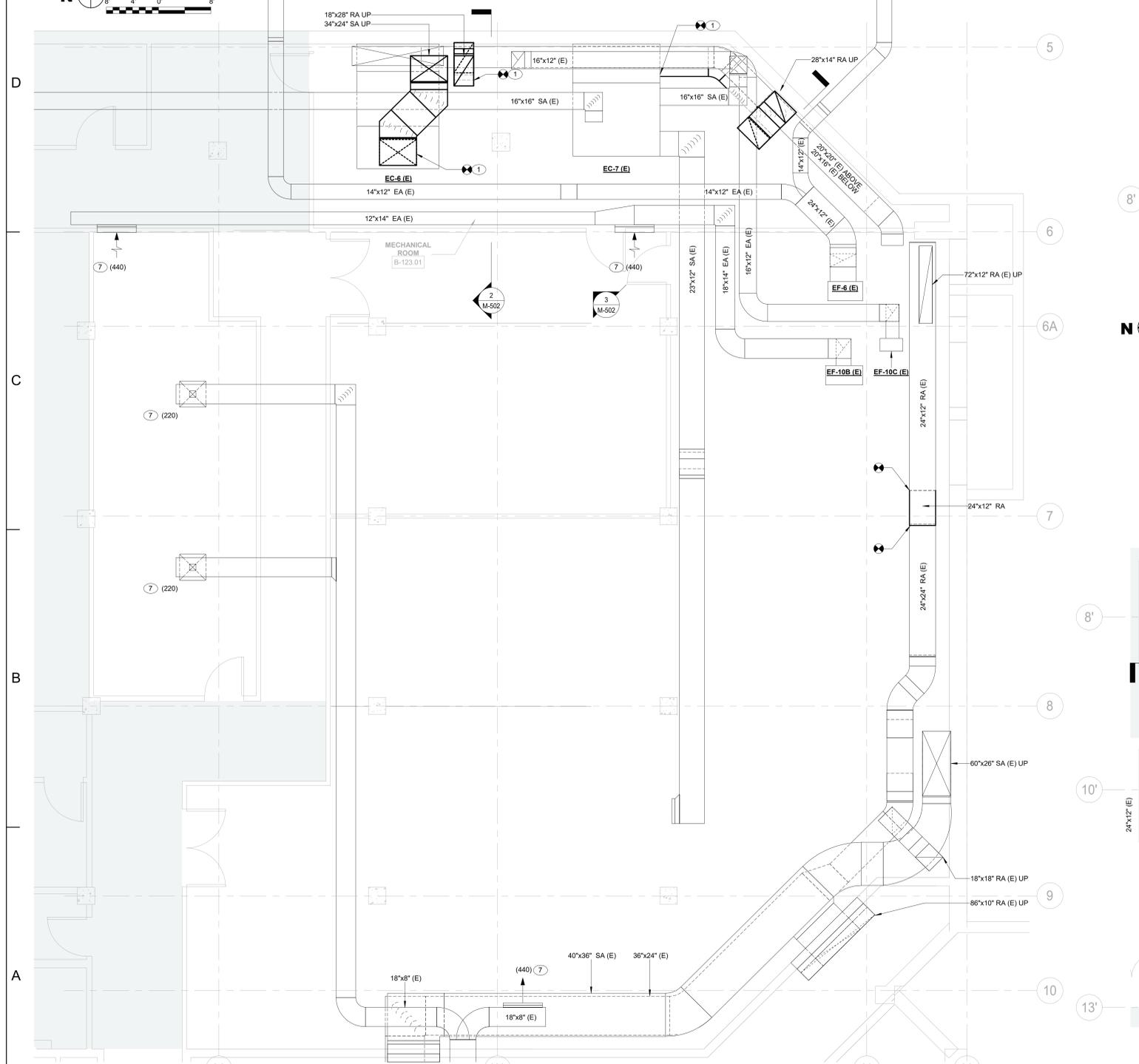
MECHANICAL 2ND & 3RD FLOOR HVAC DEMOLITION PART PLAN

M-102

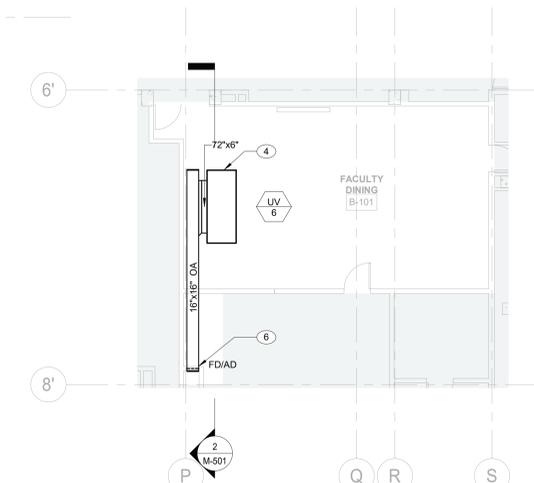
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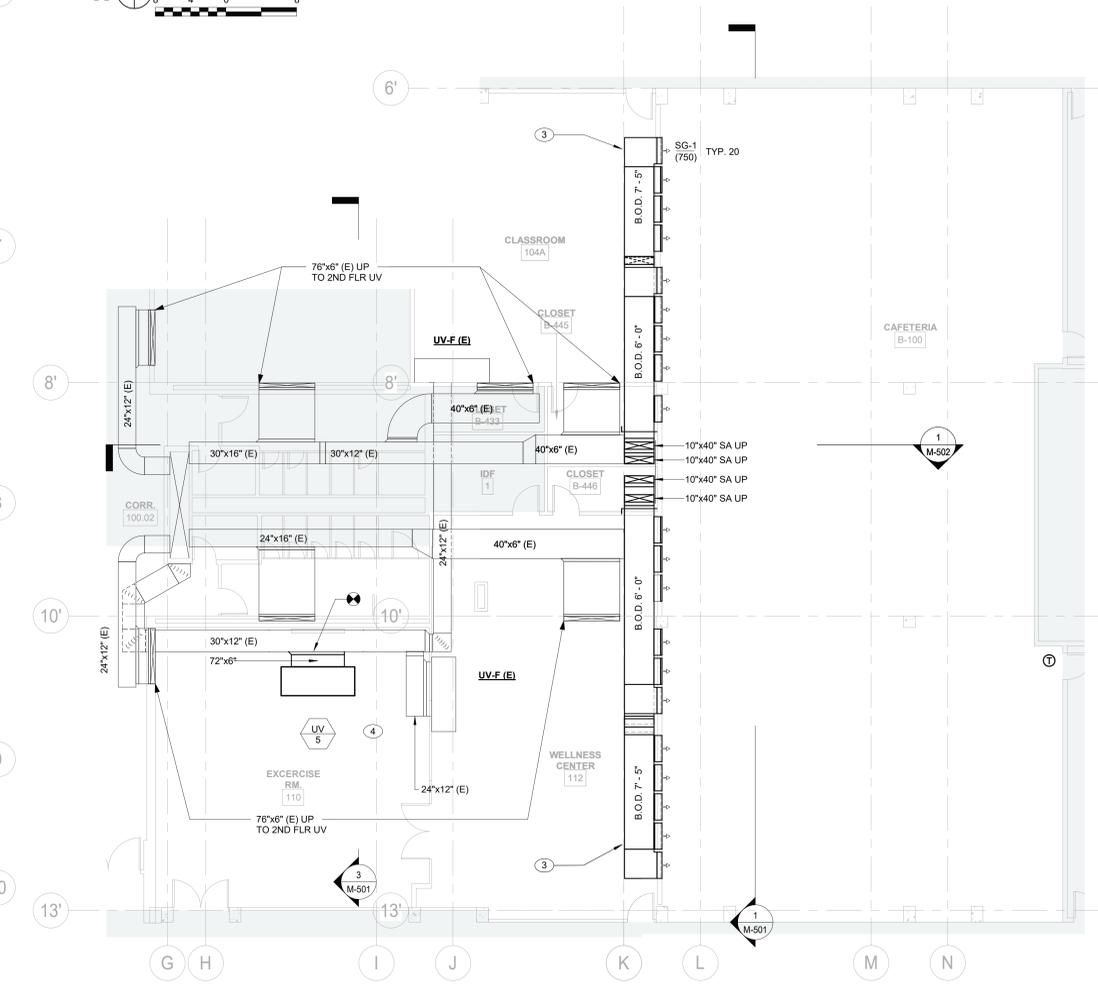
MECHANICAL 1ST FLOOR DUCTWORK CLASSROOM CONSTRUCTION PLAN



MECHANICAL ENLARGED 1ST FLOOR DUCTWORK MER CONSTRUCTION PLAN



MECHANICAL 1ST FLOOR DUCTWORK FACULTY DINING CONSTRUCTION PLAN



MECHANICAL 1ST FLOOR DUCTWORK EXERCISE RM CONSTRUCTION PLAN

- MECHANICAL NOTES:**
- CONNECT SUPPLY DUCTS TO TOP DISCHARGE OF EXISTING UNIT EC-6E. CONNECT RETURN DUCTS TO BACK INTAKES OF EXISTING UNITS EC-6E AND EC-7E.
 - INSTALL NEW CEILING MOUNTED UNIT VENTILATOR WITH REAR OUTDOOR AIR INTAKE CONNECTION.
 - NEW FIRE-RATED SOFFIT TO ENCLOSE DUCTWORK ALONG BACK WALL OF CLASSROOM AND WELLNESS CENTER SPACES. COORDINATE WITH THE ARCHITECTURAL DRAWINGS AND THE GC.
 - INSTALL NEW FLOOR MOUNTED UNIT VENTILATOR WITH REAR INTAKE PLENUM TO CONNECT TO OUTDOOR AIR INTAKE DUCT.
 - 24x22 OAI PENETRATION DOWN THROUGH FLOOR SLAB TO OUTSIDE AIR TRENCH FOR NEW AIR INTAKE. SEE ARCHITECTURAL PLANS FOR ENCLOSURE DETAILS. COORDINATE OPENING WITH STRUCTURAL DRAWINGS.
 - PENETRATION THROUGH OUTSIDE AIR SHAFT FOR NEW OUTDOOR AIR INTAKE. INSTALL FIRE DAMPER AT PENETRATION. INSTALL ACCESS DOOR.
 - BALANCE AIRFLOW TO SPECIFIED CFM AT EXISTING DIFFUSER OR GRILLE.



FIGURE 1:
RETURN DUCT FROM EC-7 ROUTE

PROJECT TITLE
SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
**183 PALMER RD
YONKERS, NY 10701**

OWNER
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MEP ENGINEER AND ENVIRONMENTAL ENGINEER
LiRo Engineers, Inc.
A LiRo Group Company
Syosset, N.Y. 516-214-8157(T)

KEY PLAN: NOT TO SCALE

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MECHANICAL 1ST FLOOR DUCTWORK CONSTRUCTION PLAN

M-201

PROJECT TITLE

SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS

183 PALMER RD
YONKERS, NY 10701

OWNER

YONKERS PUBLIC SCHOOLS

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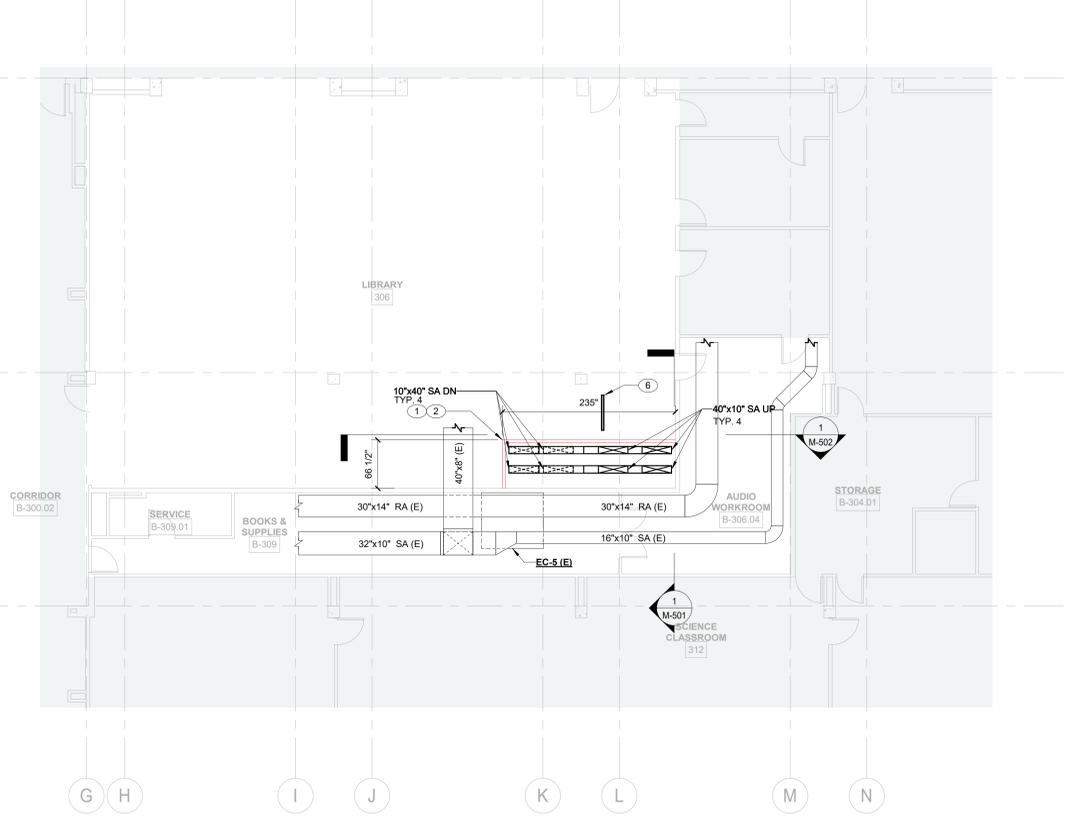
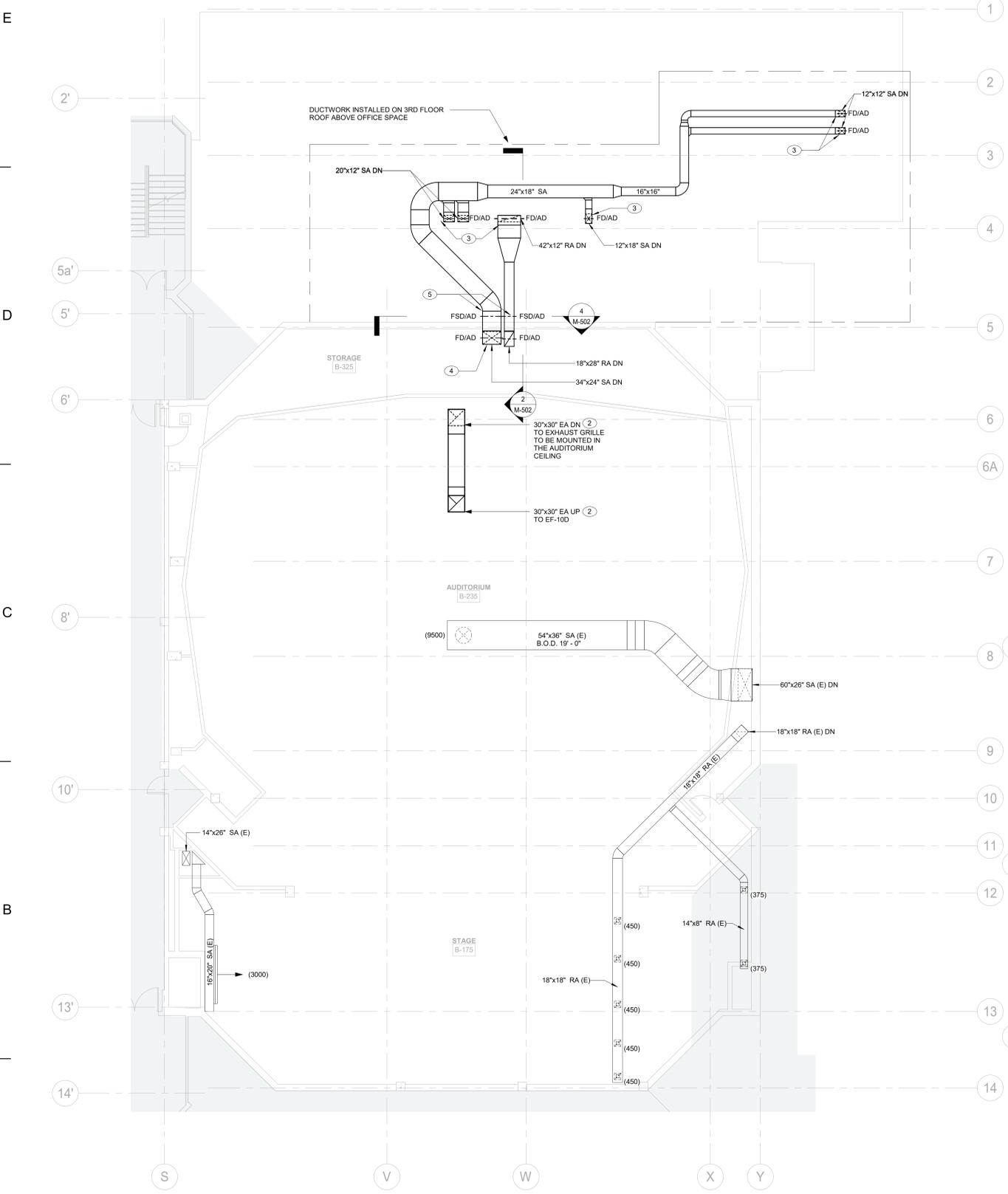
SHEET TITLE

MECHANICAL 3RD FLOOR DUCTWORK CONSTRUCTION PLAN

M-203

- MECHANICAL NOTES:**
- NEW DUCT RISERS TO BE INSTALLED THROUGH GAPS BETWEEN JOISTS. GC TO ADD NEW ENCLOSURE AT CORNER OF LIBRARY SPACE.
 - MC TO INSTALL DUCT WITH 1" ACOUSTIC LINER. DUCT DIMENSION INDICATES INTERIOR FREE AREA CROSS SECTION.
 - INSTALL FIRE DAMPER AT ROOF PENETRATIONS. PROVIDE ACCESS DOOR.
 - INSTALL FIRE DAMPER AT FLOOR SLAB PENETRATIONS. PROVIDE ACCESS DOOR.
 - INSTALL FIRE/SMOKE DAMPER AT EXTERIOR WALL PENETRATIONS. PROVIDE ACCESS DOOR.
 - RELOCATE LINEAR SLOT DIFFUSER TO NEW LOCATION. RECONNECT SUPPLY DUCT WITH FLEX DUCT.

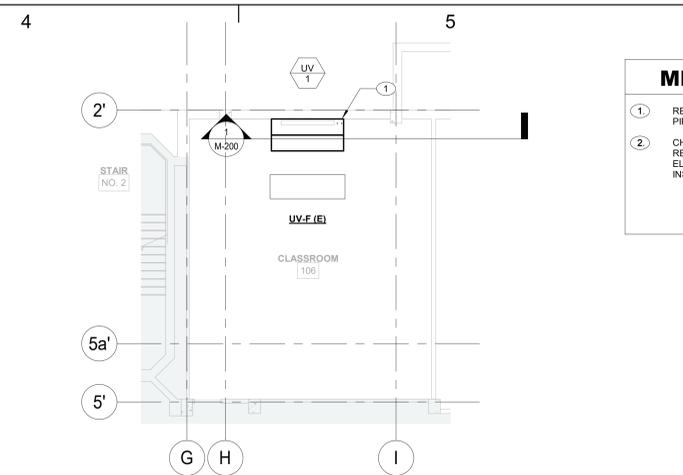
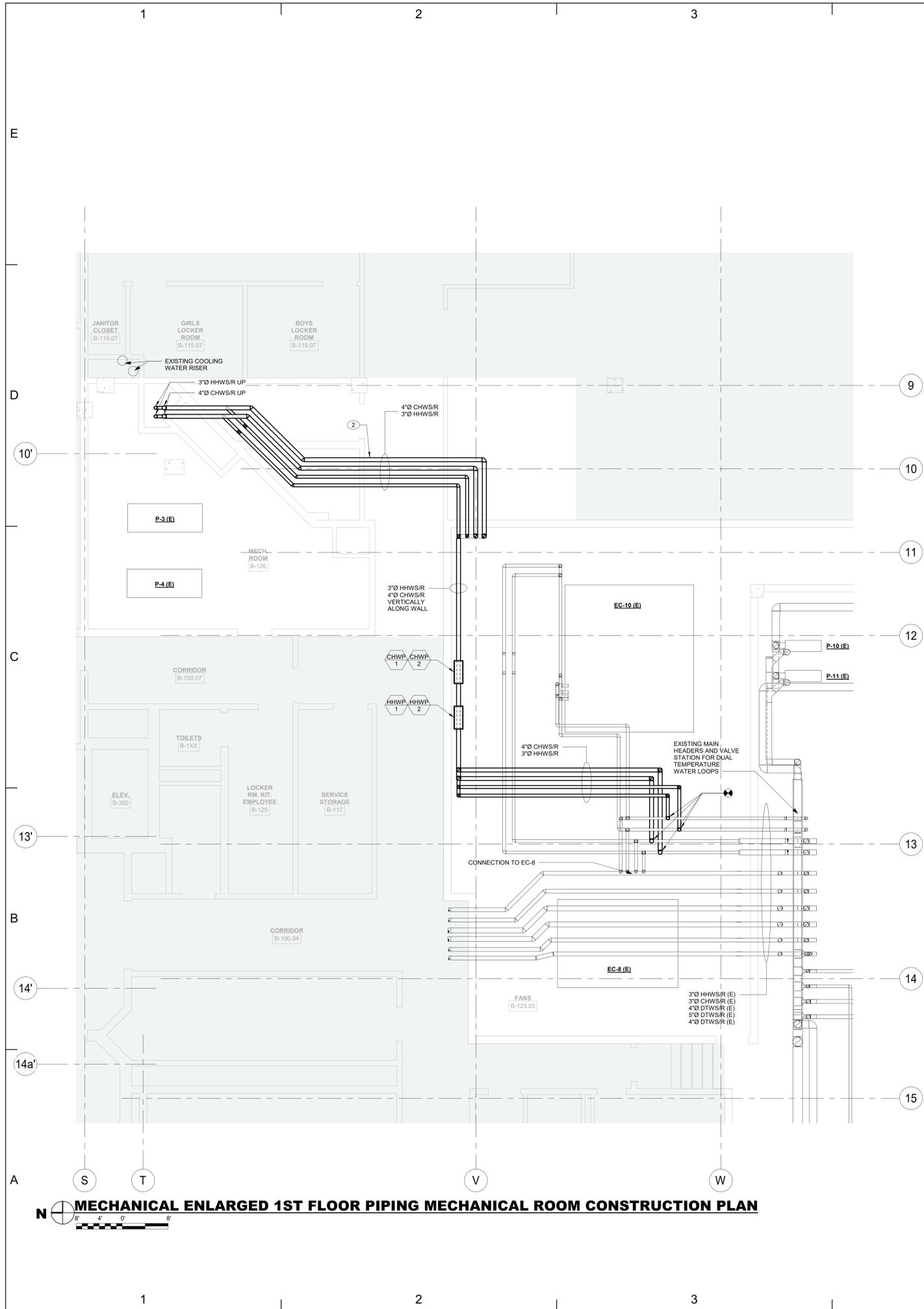
- MECHANICAL GENERAL NOTES:**
- BALANCE AIRFLOW TO SPECIFIED CFM AT EXISTING AIR OUTLETS.
 - PROVIDE ALUMINUM CLADDING FOR PROTECTION OF INSULATED DUCTWORK THAT RUNS OUTDOORS ON THE ROOF.



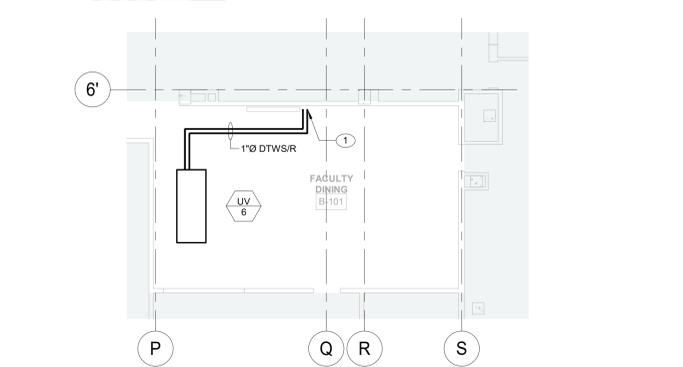
MECHANICAL 3RD FLOOR DUCTWORK OFFICE & AUDITORIUM CONSTRUCTION PLAN

MECHANICAL 3RD FLOOR DUCTWORK CAFETERIA CONSTRUCTION PLAN

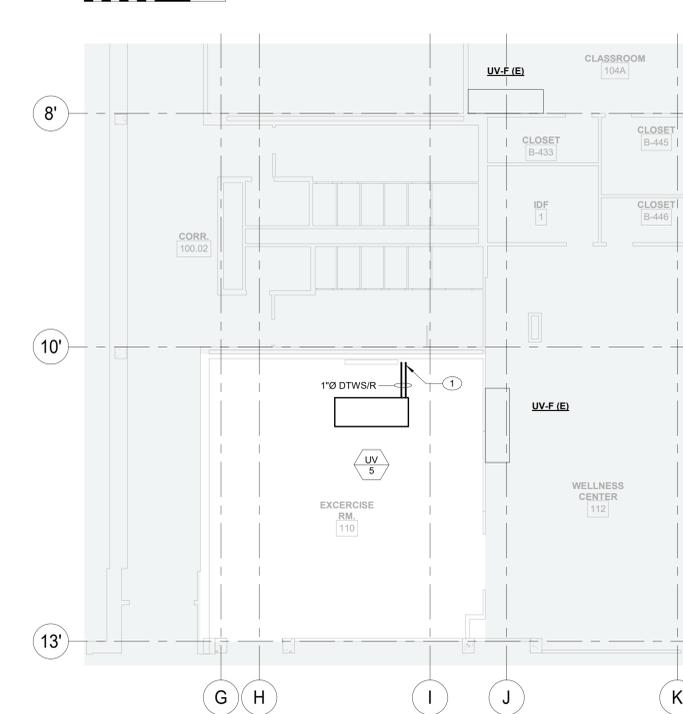
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MECHANICAL 1ST FLOOR PIPING CLASSROOM TYP. CONSTRUCTION PLAN



MECHANICAL 1ST FLOOR PIPING FACULTY DINING CONSTRUCTION PLAN



MECHANICAL 1ST FLOOR PIPING FITNESS CENTER CONSTRUCTION PLAN

- MECHANICAL NOTES:**
- RECONNECT DUAL TEMPERATURE WATER AND CONDENSATE DRAIN PIPES TO UNIT VENTILATORS.
 - CHILLED WATER SUPPLY & RETURN AND HEATING HOT WATER SUPPLY & RETURN TO BE INSTALLED IN THE HAUNCH BETWEEN BEAMS ABOVE THE ELECTRICAL CONDUITS. REMOVE LIGHT FIXTURE IN THE HALLWAY TO INSTALL AND HANG DUCTS.



FIGURE 1:
CHILLED WATER AND HEATING HOT WATER IN FAN ROOM



FIGURE 2:
UNIT VENTILATOR PIPE CONNECTION IN CLASSROOM 106

PROJECT TITLE
SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
**183 PALMER RD
YONKERS, NY 10701**

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YONKERS PUBLIC SCHOOLS

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MEP ENGINEER AND ENVIRONMENTAL ENGINEER



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MECHANICAL 1ST FLOOR PIPING CONSTRUCTION PLAN

M-301

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PROJECT TITLE

SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS

183 PALMER RD
YONKERS, NY 10701

OWNER

YONKERS PUBLIC SCHOOLS

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MEP ENGINEER AND ENVIRONMENTAL ENGINEER



SYOSSET, N.Y. 516-214-8157(T)

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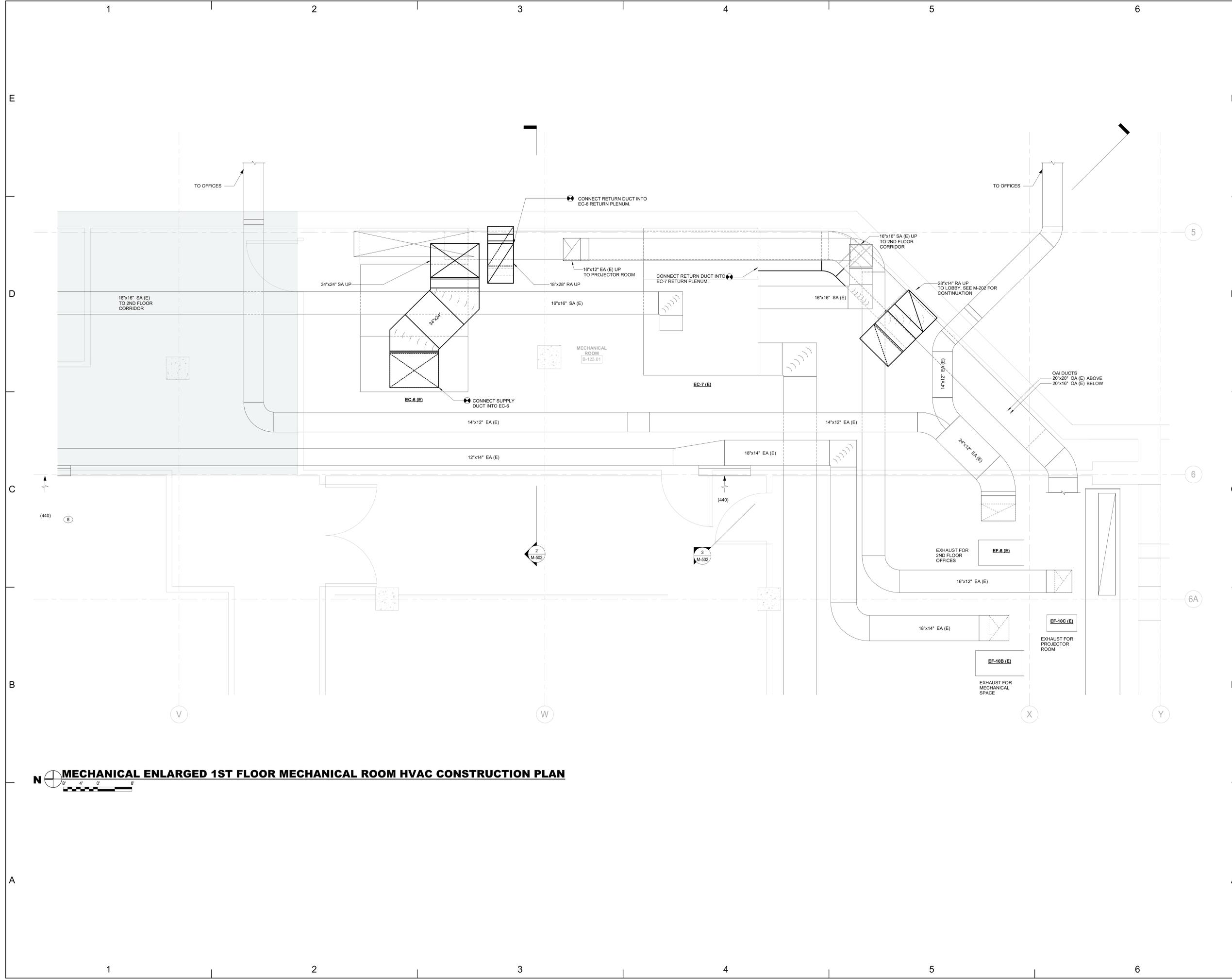


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SHEET TITLE

MECHANICAL ENLARGED HVAC CONSTRUCTION PLANS

M-401



MECHANICAL ENLARGED 1ST FLOOR MECHANICAL ROOM HVAC CONSTRUCTION PLAN



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PROJECT TITLE

SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS

183 PALMER RD
YONKERS, NY 10701

OWNER

YONKERS PUBLIC SCHOOLS

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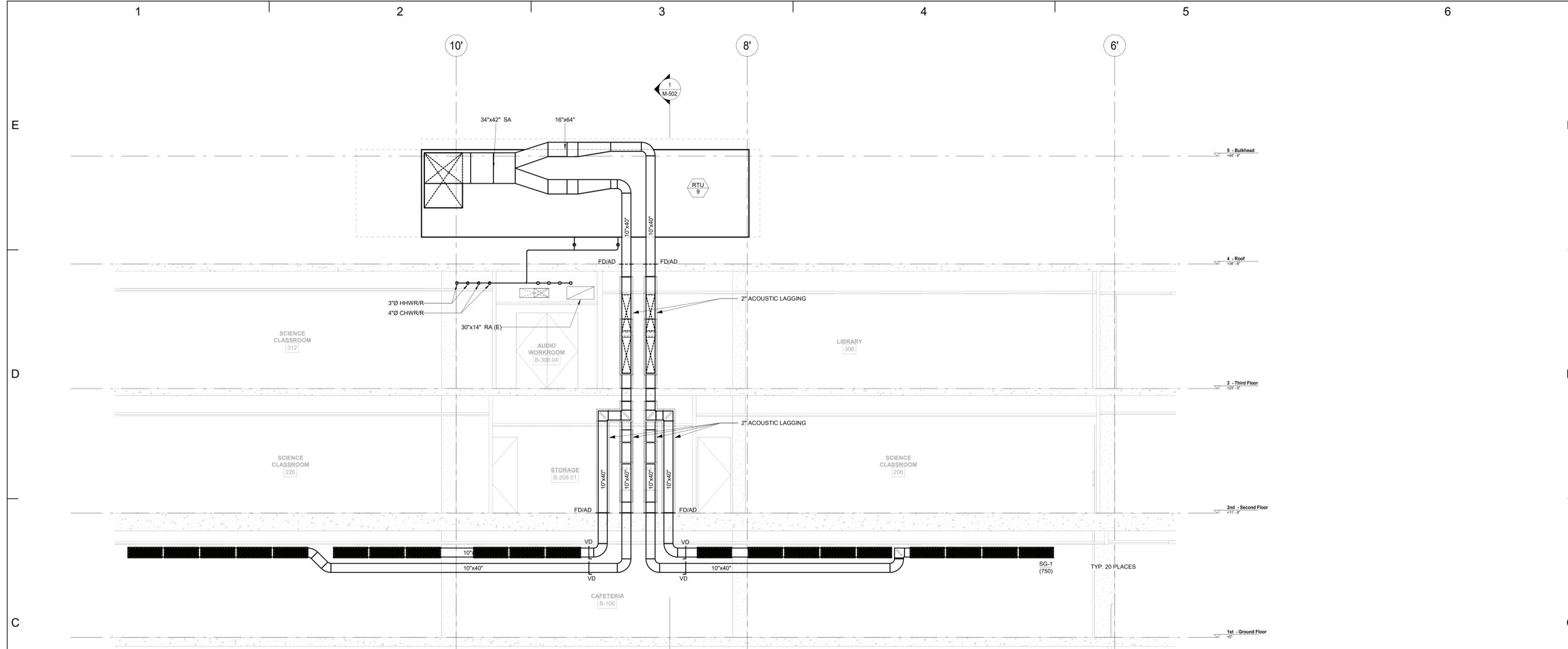
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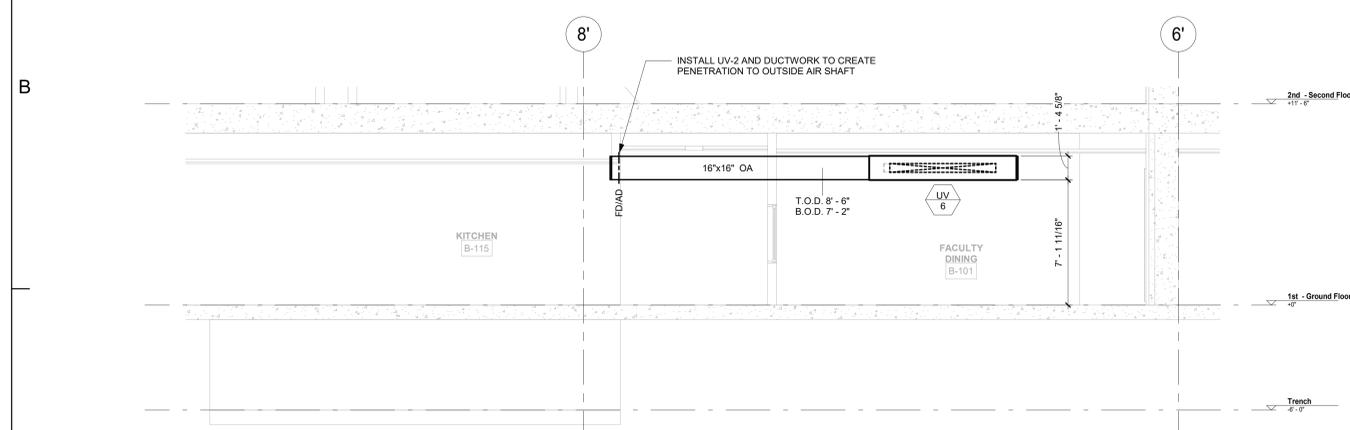
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MECHANICAL SECTIONS

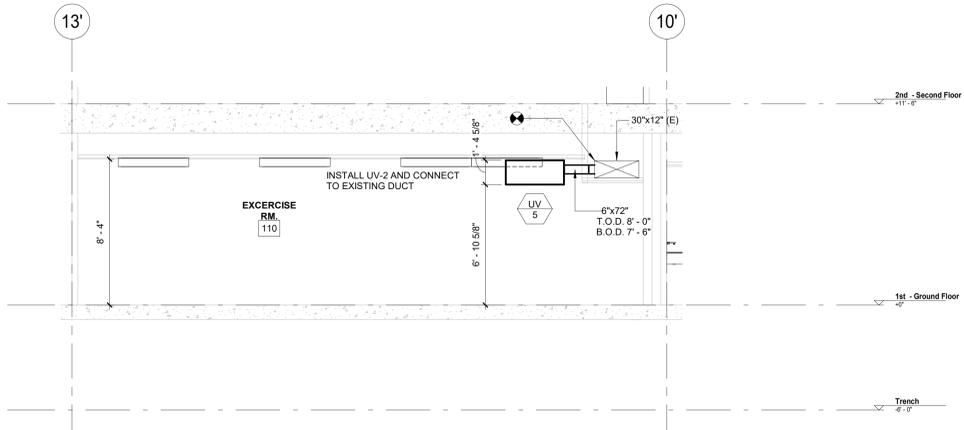
M-501



1 CAFETERIA DUCT SPLIT
M-501



2 OUTSIDE AIR SHAFT PENETRATION
M-501



3 OUTSIDE AIR SHAFT PENETRATION
M-501



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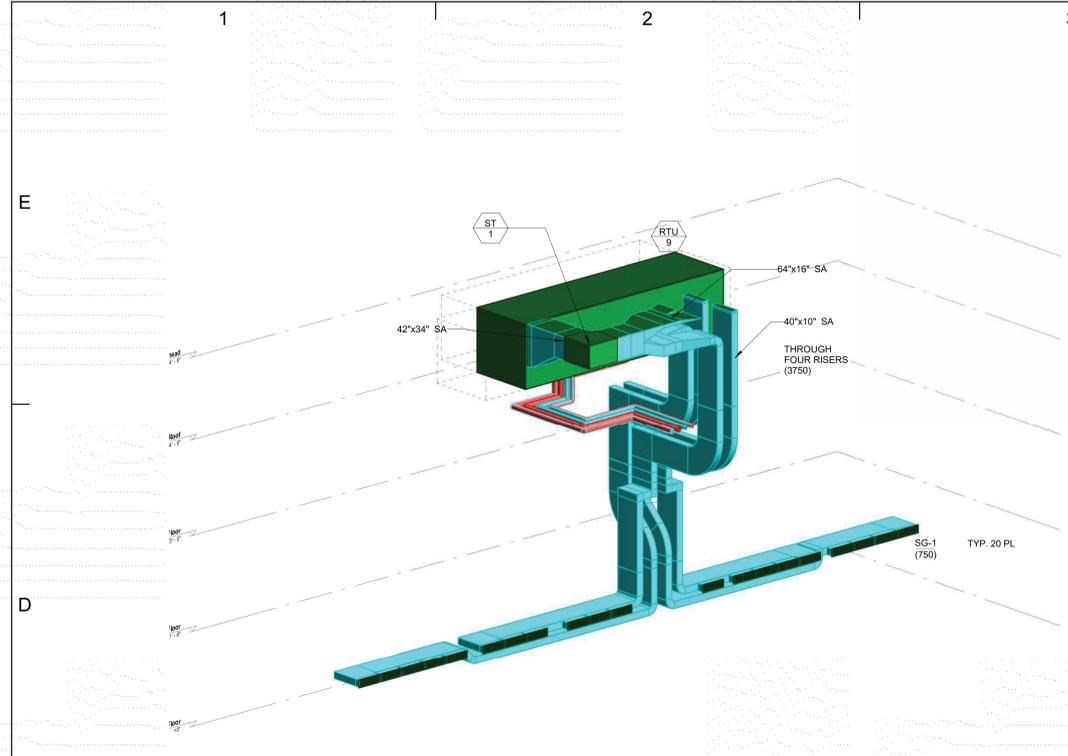
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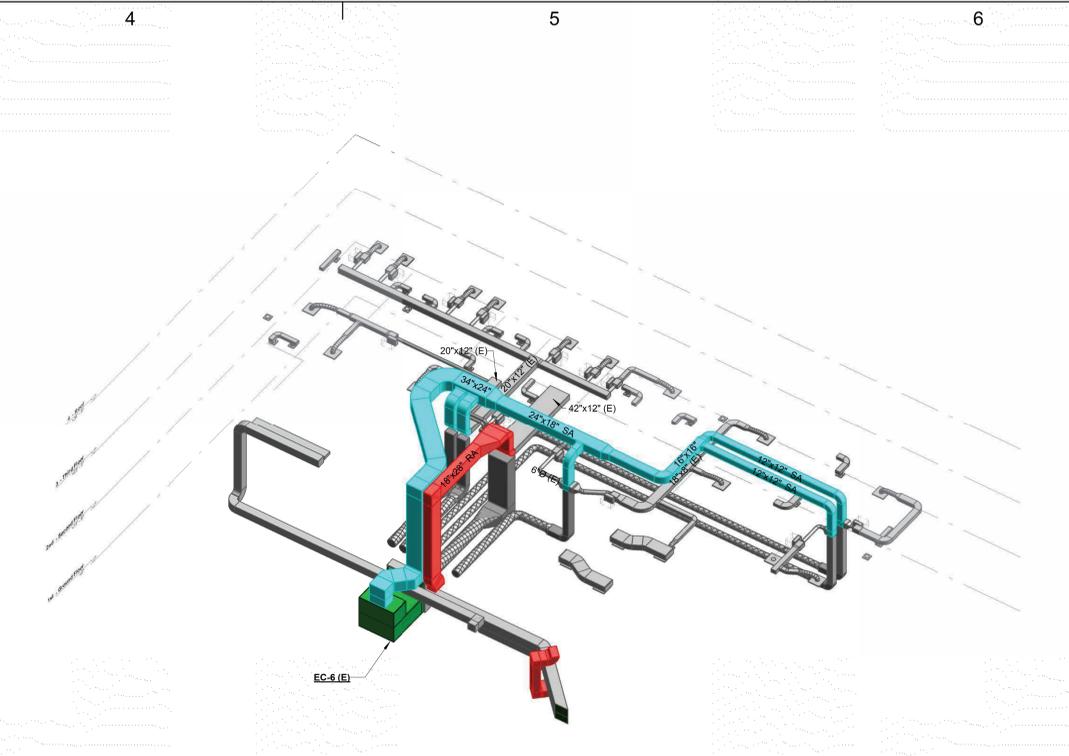
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MECHANICAL ISOMETRIC VIEWS

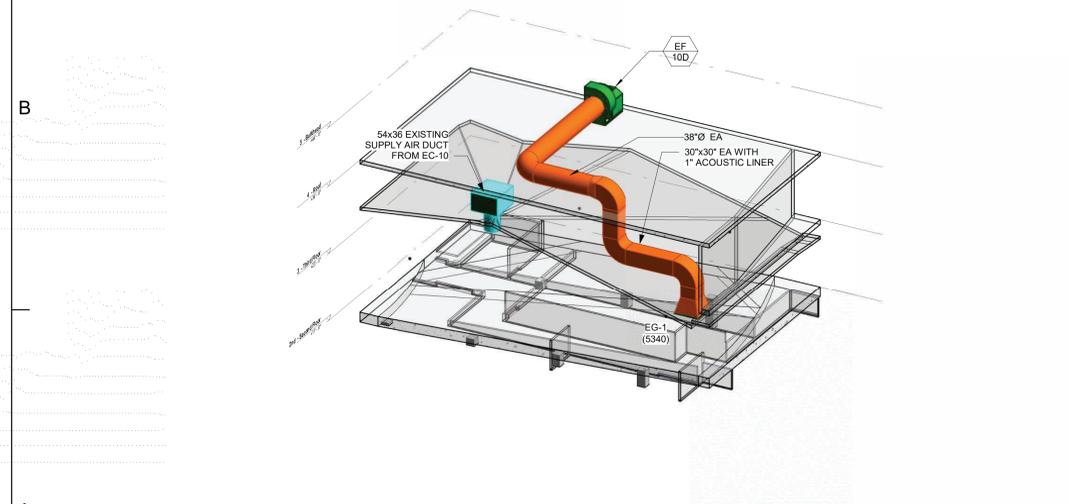
M-503



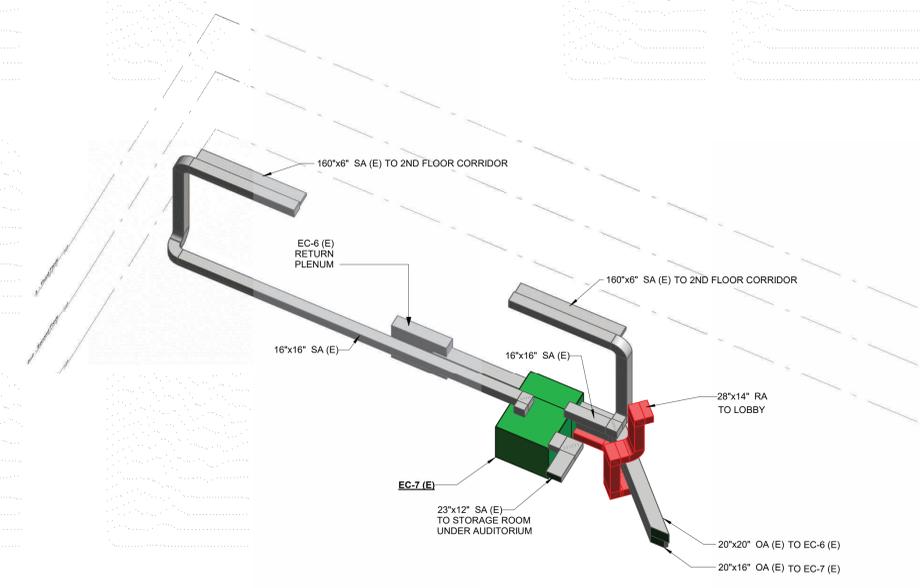
1 CAFETERIA DUCTWORK
 M-503 41/8" = 1'-0"



2 OFFICE DUCTWORK
 M-503 43/32" = 1'-0"



3 AUDITORIUM EXHAUST
 M-503 43/32" = 1'-0"



4 LOBBY DUCTWORK
 M-503 41/8" = 1'-0"

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AIR HANDLING UNIT SCHEDULE																	
TAG	MANUFACTURER / MODEL	LOCATION	SERVICE	SUPPLY FAN								FILTER					
				TOT. SA (CFM)	TOT. OA (CFM)	ESP IN.WG	TSP IN.WG	FAN QTY	TYPE	DRIVE	FAN RPM	TOT. BHP	MOT. HP EA	MERV	DEPTH AND TYPE	FINAL PD (IN WG)	NOTES
RTU-9	DAIKIN / RAH047C	UPPER ROOF	STUDENT DINING	15000	15000	1.7	3.84	1.0	ODP	DIRECT	813	15.2	20	14	CARTRIDGE	0.37	2' PLEATED PRE-FILTERS

AIR HANDLING UNIT SCHEDULE																																				
TAG	COOLING COIL															HOT WATER HEATING COIL										ELECTRICAL			UNIT DIM. (LxWxH)	OPER. WEIGHT (LB)	NOTES					
	FLUID	AIRFLOW (CFM)	MAX FACE VEL (FPM)	EDBT (°F)	EWBT (°F)	LDWT (°F)	LWBT (°F)	TOT. (MBH)	SENS. (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	AIR PD (IN WG)	FLUID PD (FT H2O)	ROWS	FPI	QTY STACKED COILS	FLUID	AIRFLOW (CFM)	MAX FACE VEL (FPM)	EDBT (°F)	LDWT (°F)	LWBT (°F)	CAP. (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	AIR PD (IN WG)				FLUID PD (FT H2O)	ROWS	FPI	QTY COILS	POWER V-PH-HZ
RTU-9	H2O	15000	413.1	92.5	73	52.1	1015	659	129.0	44.0	59.7	1.6	6.2	8.0	12.0	1.0	H2O	15000	355.5	14.3	85.0	1065	40.0	180	126.5	0.2	0.3	2.0	9.0	1.0	208-3-60	54.3	125	360x99x97	10936	1,2,3,4

NOTES:
1. PROVIDE UNIT WITH FACTORY MOUNTED FAN VFD, DISCONNECT SWITCH AND BUILT-IN PREPROGRAMMED CONTROLLER.
2. PROVIDE UNIT CONFIGURED FOR 100% OUTDOOR AIR OPERATION WITH SIDE SUPPLY DISCHARGE.
3. PROVIDE WATER COIL CONNECTIONS FROM THE BOTTOM OF THE UNIT. HEATING COIL TO BE INSTALLED BEFORE THE COOLING COIL. COIL CONTROL VALVES TO BE PROVIDED BY UNIT MANUFACTURER AND BE SHIPPED LOOSE TO BE INSTALLED BY MC.
4. PROVIDE UNIT WITH FACE AND BYPASS DAMPERS WITH ACTUATORS AROUND THE COOLING COIL. CONTROLS FOR THE BYPASS DAMPERS TO BE COMPLETED BY CONTROLS CONTRACTOR THROUGH EXTERNAL CONTROL PANEL. UNIT MANUFACTURER VIA FIELD-INSTALLED SUPPLEMENTARY CONTROL PANEL.

UNIT VENTILATOR SCHEDULE																										
TAG	MANUFACTURER	MODEL	TYPE	SERVICE	CFM	OA CFM	ESP (IN. WG.)	COOLING COIL										HEATING COIL					ELECTRICAL			
								TOTAL LOAD (BTUHR)	EAT	LAT	EWT (DEGF)	LWT (DEGF)	P.D. (FT HD)	FLOW (GPM)	TOTAL LOAD (BTUHR)	EAT	LAT	EWT (DEGF)	LWT (DEGF)	P.D. (FT HD)	FLOW (GPM)	MOTOR FLA	NOMINAL HP	V.PH.HZ		
UV-1	MAGICAIRE	MAUVF-5	VERTICAL	CLASSROOM 106	1500	425	0	60135	80	53.75	44	56	9.63	10.00	107098	55	120	180	148	9.63	10.00	4.7	0.5	120.1.60		
UV-2	MAGICAIRE	MAUVF-5	VERTICAL	CLASSROOM 105	1500	700	0	60135	80	53.75	44	56	9.63	10.00	107098	55	120	180	148	9.63	10.00	4.7	0.5	120.1.60		
UV-3	MAGICAIRE	MAUVF-5	VERTICAL	CLASSROOM 103	1500	300	0	60135	80	53.75	44	56	9.63	10.00	107098	55	120	180	148	9.63	10.00	4.7	0.5	120.1.60		
UV-4	MAGICAIRE	MAUVF-5	VERTICAL	CLASSROOM 101	1500	300	0	60135	80	53.75	44	56	9.63	10.00	107098	55	120	180	148	9.63	10.00	4.7	0.5	120.1.60		
UV-5	MAGICAIRE	MAUHF5	HORIZONTAL	EXERCISE ROOM	1500	325	0	60135	80	53.75	44	56	9.63	10.00	107098	55	120	180	148	9.63	10.00	4.7	0.5	120.1.60		
UV-6	MAGICAIRE	MAUHF5	HORIZONTAL	FACULTY DINING	1500	875	0	60135	80	53.75	44	56	9.63	10.00	107098	55	120	180	148	9.63	10.00	4.7	0.5	120.1.60		

NOTES:
1. UNIT MIXES RETURN AIR FROM FRONT INTAKE WITH OUTSIDE AIR SUPPLIED TO THE BACK OF THE UNIT VIA DUCT OR PLENUM.
2. PROVIDE UNIT WITH 2-PIPE COIL ARRANGEMENT AND FACE AND BYPASS FUNCTIONALITY FOR FREEZE PROTECTION.
3. PROVIDE UNIT WITH BUILT-IN DIGITAL CONTROLLER.
4. PROVIDE LITTLE GIANT CONDENSATE PUMP FOR SUSPENDED HORIZONTAL UNITS.

PUMP SCHEDULE														
TAG	MANUFACTURER	MODEL	LOCATION	SERVICE	PUMP TYPE	FLUID TYPE	FLOW (GPM)	HEAD (FT.WG)	MOTOR DATA			UNIT DIM. (LxWxH)	OPER. WEIGHT (LB)	NOTES
									RPM	HP	V-PH-HZ			
CHWP-1	BELL & GOSSETT	BG-E80-2.5x2.5x9.5C-SS182JM-1N	BOILER ROOM	CHILLED WATER	INLINE	H2O	129	40	1750	3	208-3-60	21.5"x11.75"x28.13"	265	1,2,3,4,5,6,7
CHWP-2	BELL & GOSSETT	BG-E80-2.5x2.5x9.5C-SS182JM-1N	BOILER ROOM	CHILLED WATER	INLINE	H2O	129	40	1750	3	208-3-60	21.5"x11.75"x28.13"	265	1,2,3,4,5,6,7
HHWP-1	BELL & GOSSETT	BG-E90-150AAB-075-1725-1	BOILER ROOM	HEATING HOT WATER	INLINE	H2O	40	24	1750	0.75	208-3-60	11.5"x3"x17.25"	63	1,2,3,4,5,6,7
HHWP-2	BELL & GOSSETT	BG-E90-150AAB-075-1725-1	BOILER ROOM	HEATING HOT WATER	INLINE	H2O	40	24	1750	0.75	208-3-60	11.5"x3"x17.25"	63	1,2,3,4,5,6,7

NOTES:
1. ALL CONTROL WIRING, RELAYS, MISCELLANEOUS DEVICES SHALL BE BY DIVISION 23.
2. PROVIDE VIBRATION ISOLATORS SIZED FOR MINIMUM 90% DAMPENING EFFICIENCY.
3. PROVIDE PREMIUM EFFICIENCY INVERTER DUTY MOTORS AND VFDs.
4. M.C. TO PROVIDE PUMP INSULATION COVERS.
5. PROVIDE MECHANICAL SEALS FOR INLINE PUMPS.
6. INSTALL PUMP PER MANUFACTURER'S SPECIFICATION.

DIFFUSER SCHEDULE										
TAG	MANUFACTURER / MODEL	SERVICE	MAX FLOW CFM	NECK SIZE (IN)	FACE SIZE (IN)	APD (IN.WG)	MAX NC	NOTES		
								1	2	3
SG-1	TITUS / 300RS-HD	SUPPLY	750	36X10	38X12	0.020	10.0			1,2,3,4,5
RG-1	TITUS / 350RL	RETURN	4000	48X30	50X32	0.035	12.5			1,2,3,4,5
EG-1	TITUS / 350RL	EXHAUST	5340	48X48	50X50	0.020	10.0			1,2,3,4,5

NOTES:
1. 1.14-INCH WIDE BORDER ON ALL SIDES. SCREW HOLES SHALL BE COUNTERSUNK FOR A NEAT APPEARANCE. TAMPER RESISTANT SCREWS TO BE USED FOR INSTALLATION. CORNERS...
2. BLADES SHALL BE FIRMLY HELD IN PLACE BY MULLIONS FROM BEHIND THE GRILLE AND FIXED TO THE GRILLE BY WELDING IN PLACE. BLADE DEFLECTION ANGLE SHALL BE 35°.
3. OPPOSED-BLADE VOLUME DAMPER SHALL BE CONSTRUCTED OF HEAVY GAUGE STEEL. DAMPER MUST BE OPERABLE FROM THE FACE OF THE GRILLE.
4. THE GRILLE FINISH SHALL BE #26 WHITE.
5. THE MANUFACTURER SHALL PROVIDE PUBLISHED PERFORMANCE DATA FOR THE GRILLE. THE GRILLE SHALL BE TESTED IN ACCORDANCE WITH ANSI/ASHRAE STANDARD 70-1991.

SOUND ATTENUATOR SCHEDULE																			
TAG	MANUFACTURER	MODEL	SERVICE	LOCATION	DIMENSION			AIRFLOW (CFM)	VELOCITY (FPM)	P.D. MAX (IN.WG)	DYNAMIC INSERTION LOSS								OPER. WEIGHT (LB)
					WIDTH (IN)	HEIGHT (IN)	LENGTH (IN)				63 HZ	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ	
ST-1	VIBRO-ACOUSTICS	RED-UHV-25353	RTU-9 SUPPLY AIR	ROOFTOP DUCTWORK	42	34	60	15000	1513	0.18	6	8	8	16	18	24	18	14	235

NOTES:
1. LENGTH SHOWN FOR ELBOW SILENCERS IS CENTERLINE LENGTH.
2. NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED ACOUSTICAL CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT DUCTBORNE FAN...
3. NON-BASIS OF DESIGN SILENCER MANUFACTURER SHALL PROVIDE, FOR APPROVAL, PROFESSIONAL ENGINEER STAMPED PRESSURE DROP CALCULATIONS FOR ALL SYSTEMS WITH SILENCERS TO DEMONSTRATE THAT THE RESULTANT INSTALLED...
4. FOR NON-BASIS OF DESIGN PRODUCT SUPPLIED, CONTRACTOR IS FINANCIALLY RESPONSIBLE TO ENSURE NOISE CONTROL SOLUTION IS DELIVERED TO ACHIEVE SPECIFIED RC LEVEL IN SPACES AS PER SED DESIGN GUIDELINES FOR HVAC SYSTEM...

ELECTRIC UNIT HEATER SCHEDULE							
TAG	MANUFACTURER	MODEL	SERVICE	TYPE	KW	V-PH-HZ	NOTES
EUH-1	MODINE	HER75	RTU-9	SUSPENDED	7.5	208-3-60	

NOTES:
1. PROVIDE ALL CONTACTS, RELAYS, AND DEVICES NECESSARY FOR STANDALONE OPERATION.
2. PROVIDE STAINLESS STEEL WALL AND CEILING SWIVEL TYPE MOUNTING BRACKET.

FAN SCHEDULE														
TAG	MANUFACTURER / MODEL	LOCATION	SERVICE	TYPE	DRIVE	FLOW (CFM)	TSP IN.WG	ELECTRICAL				UNIT DIM. (LxWxH)	OPER. WEIGHT (LB)	NOTES
								HP	BHP	RPM	V-PH-HZ			
EF-10D	GREENHECK / USF-30	ROOF	AUDITORIUM	UTILITY SET FAN	DIRECT	5340	0.50	5.00	0.61	870	208-3-60	50.47x51.13x76.77	814	1,2,3

NOTES:
1. PROVIDE MOTORIZED BACK DRAFT DAMPER.
2. PROVIDE FACTORY MOUNTED ISOLATION BASE WITH RESTRAINED SPRING ISOLATORS SIZED FOR MINIMUM 90% DAMPENING EFFICIENCY.
3. MC TO INSTALL VFD LOCATED NEAR EF-10A.

VARIABLE FREQUENCY DRIVE SCHEDULE					
ID	MANUFACTURER	MODEL	TECHNICAL DATA	COMMENTS	
EC-10 VFD	ABB	ACH580-BCR-114A-2+B056+F267+G390+K491	208 VAC 3-PHASE; 40 HP; 6-PULSE. SOFT START BYPASS	NEMA 12 ENCLOSURE	
CHWP-1 VFD	B&G	A2	208 VAC 3-PHASE; 3 HP	NEMA 12 ENCLOSURE	
CHWP-2 VFD	B&G	A2	208 VAC 3-PHASE; 3 HP	NEMA 12 ENCLOSURE	
HHWP-1 VFD	B&G	A2	208 VAC 3-PHASE; 1.5 HP	NEMA 12 ENCLOSURE	
HHWP-2 VFD	B&G	A2	208 VAC 3-PHASE; 1.5 HP	NEMA 12 ENCLOSURE	
EF-10D VFD	ABB	ACH550-BCR-06A6-2+B055	208 VAC 3-PHASE; 1.5 HP; 6-PULSE.	NEMA 12 ENCLOSURE	

NOTE:
1. VFD TO BE PROVIDED BY MC AND INSTALLED BY EC

VENTILATION SCHEDULE									
ZONE	Az	OCCUP. DENSITY	Code Occupancy	Rp	Ra	Ez	Voz	Design OAI	
TAG	NAME	SF	PER/1000 SQFT	Category	CFM/PER	CFM/SF	/	CFM	CFM
UV-1	CLASSROOM 106	876	35	CLASSROOM	10	0.12	1.0	412	425
UV-2	CLASSROOM 105	1446.47	35	CLASSROOM	10	0.12	1.0	680	700
UV-3	CLASSROOM 103	776.87	25	COMPUTER LAB	10	0.12	1.0	287	300
UV-4	CLASSROOM 101	1037.9	35	CLASSROOM	10	0.12	1.0	488	500
UV-5	EXERCISE ROOM	987.14	10	WEIGHT ROOM	20	0.06	0.8	321	325
UV-6	FACULTY DINING	734.93	100	CAFETERIA	7.5	0.18	0.8	854	875
RTU-9	STUDENT DINING	4205	100	CAFETERIA	7.5	0.18	1.0	3911	15000

PROJECT TITLE
SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
**183 PALMER RD
YONKERS, NY 10701**

OWNER
YONKERS PUBLIC SCHOOLS

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(716) 914-5924-4444

MEP ENGINEER AND ENVIRONMENTAL ENGINEER

LiRo Engineers, Inc.
A LiRo Group Company
Syosset, N.Y. 516-214-8157(T)

KEY PLAN: NOT TO SCALE

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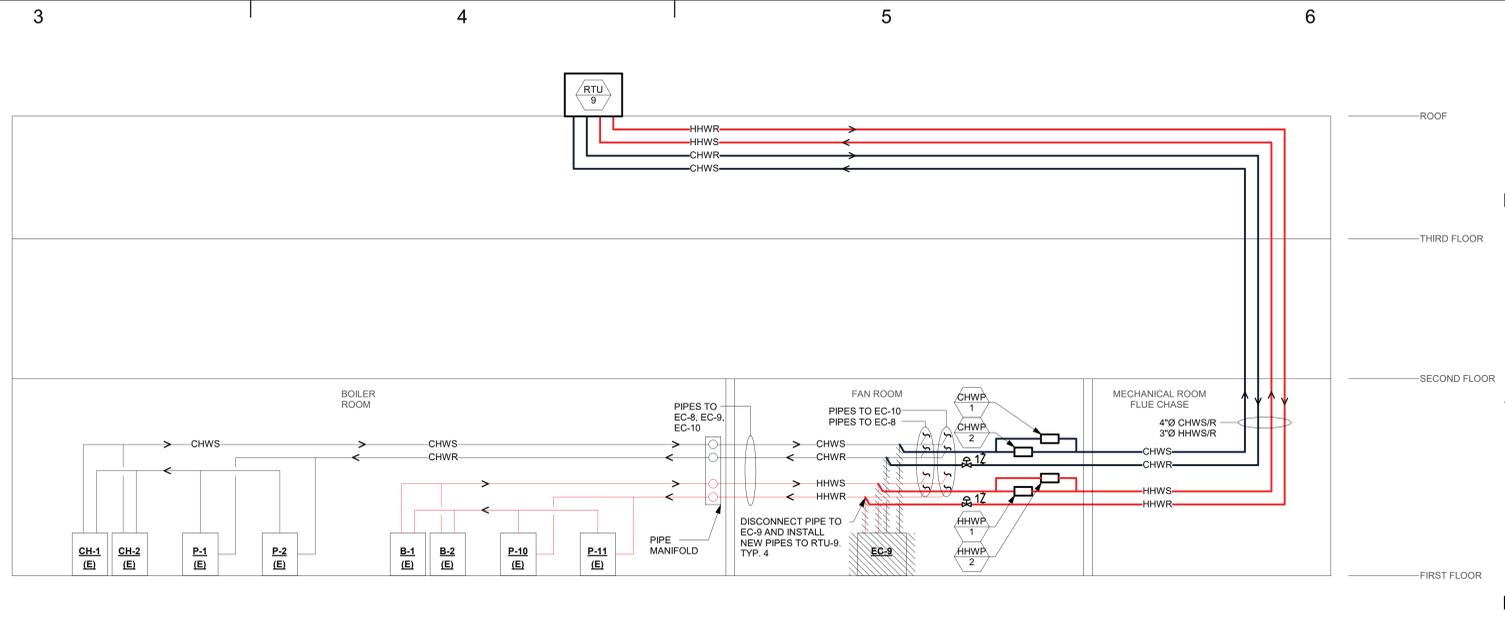
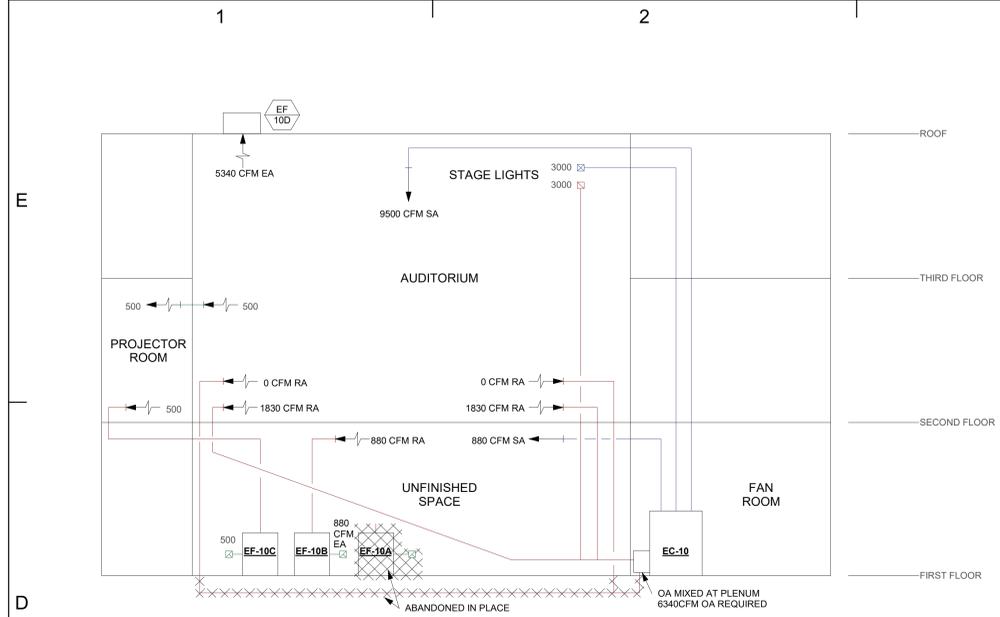
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03/27/20	90% CONSTRUCTION DOCUMENTS	
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MECHANICAL SCHEDULES

M-601

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2 AUDITORIUM NEW AIRFLOW DIAGRAM
M-701 SCALE: NOT TO SCALE

SPACE	SUPPLY		RETURN		
	SUPPLY AIR	OUTSIDE AIR	TRANSFER AIR	RETURN AIR	EXHAUST AIR
AUDITORIUM	9500	5840	500	6660	2340
STAGE LIGHTS	3000	-	-	-	3000
UNFINISHED SPACE	880	880	-	-	880
PROJECTOR ROOM	500	-	-	-	500

NOTES:
1. THE VENTILATION REQUIREMENT FOR THE UNFINISHED SPACE ONLY REQUIRES 200CFM OUTSIDE AIR. THE EXHAUST REQUIREMENT FOR TWO AIR CHANGES IS MORE STRINGENT, REQUIRING 880CFM

3 PUMP SINGLE LINE DIAGRAM
M-701 SCALE: NOT TO SCALE

PROJECT TITLE
SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
**183 PALMER RD
YONKERS, NY 10701**

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MECHANICAL FLOW DIAGRAMS

M-701

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PROJECT TITLE

SAUNDERS TRADES AND TECHNICAL HIGH SCHOOL HVAC UPGRADES

PROJECT ADDRESS
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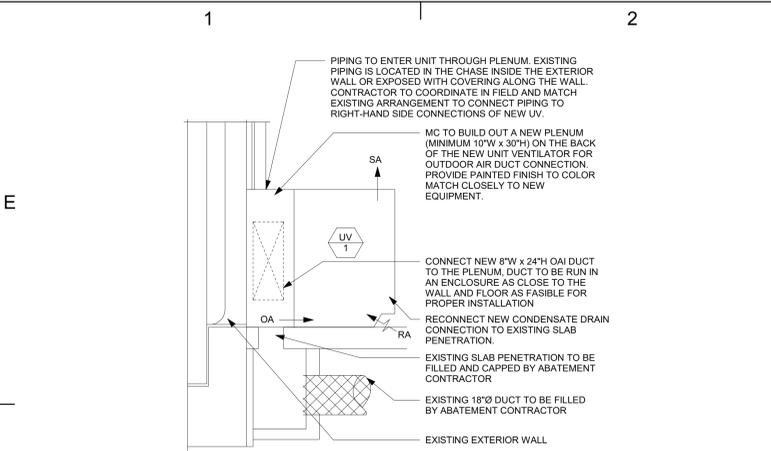
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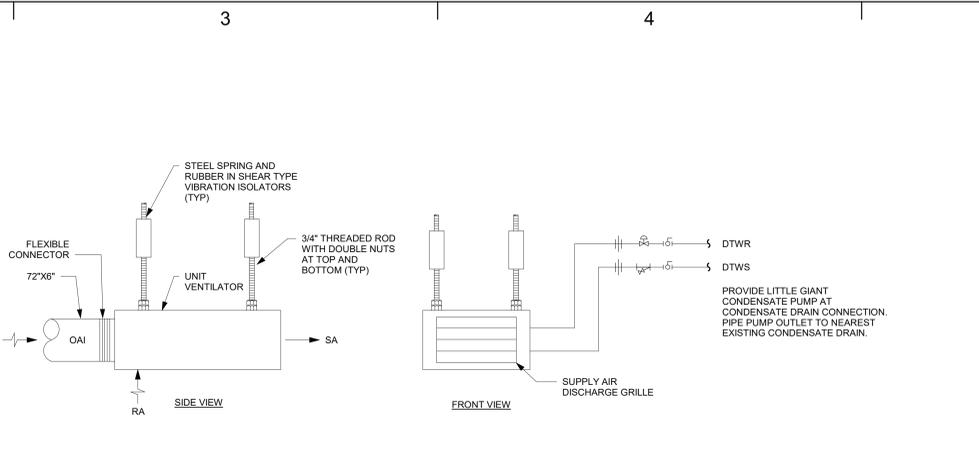
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MECHANICAL DETAILS

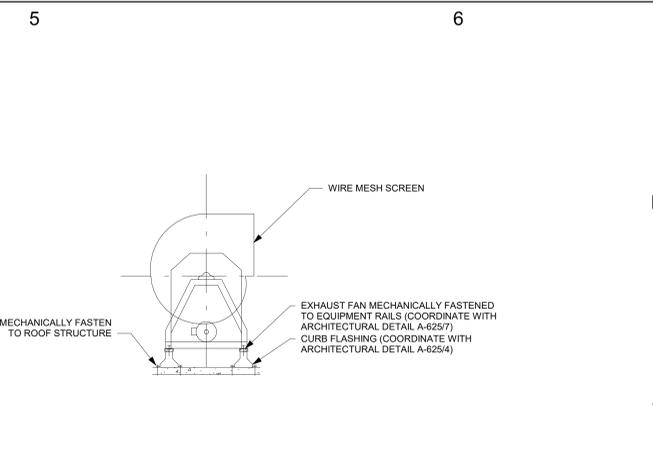
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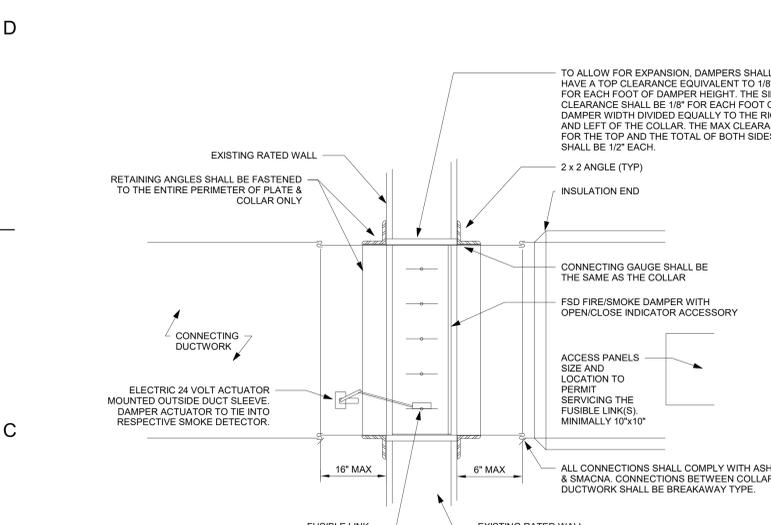
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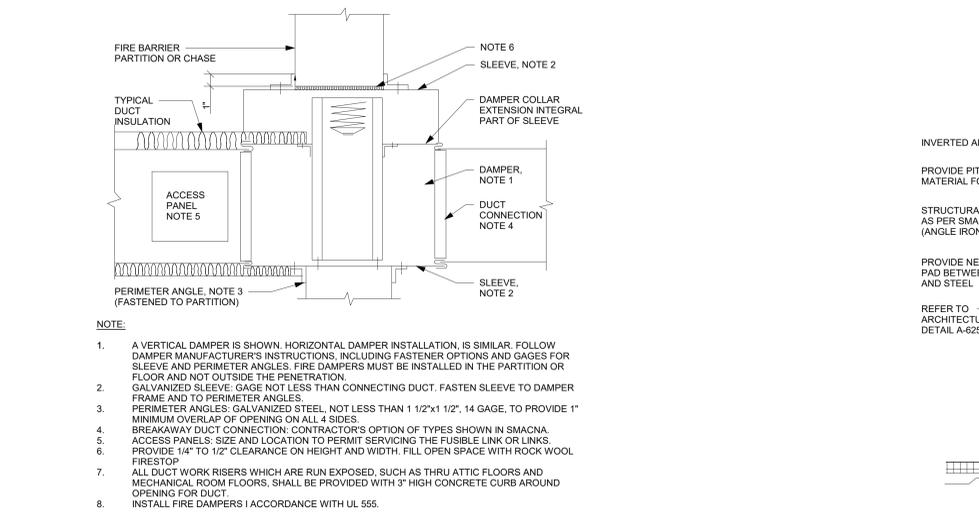
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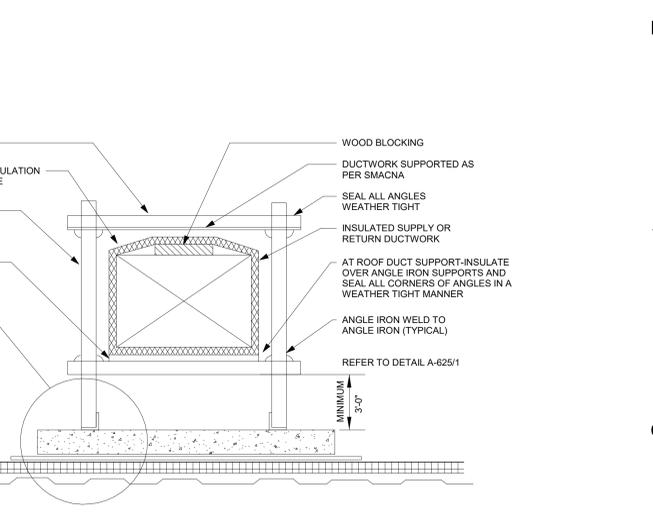
3 ROOF MOUNTED EXHAUST FAN
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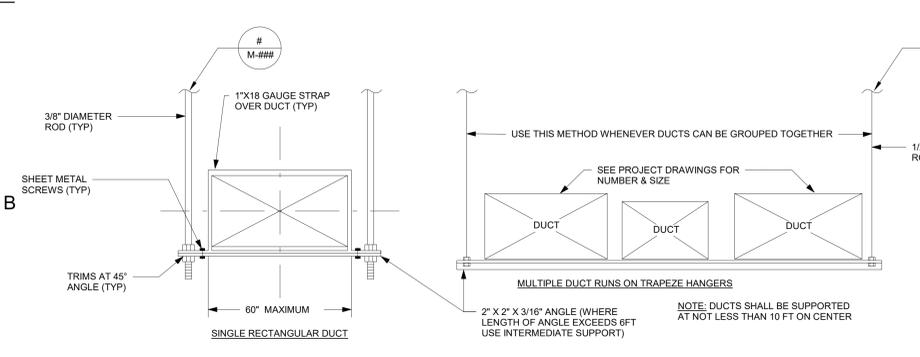
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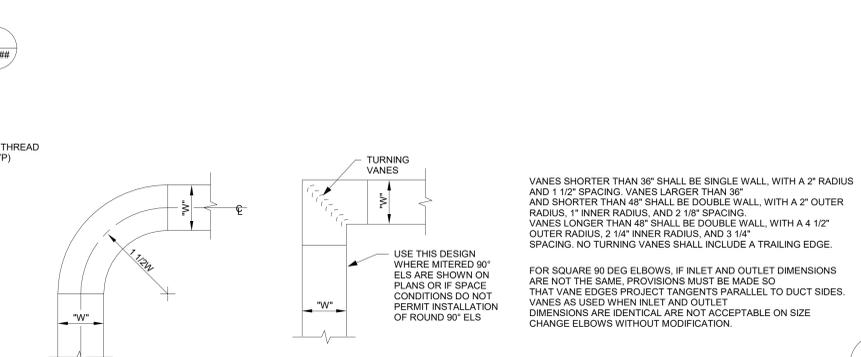
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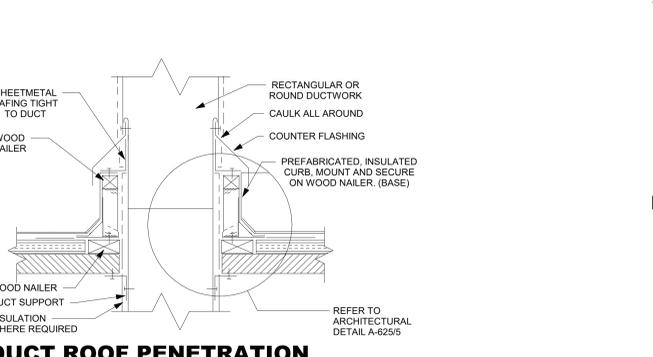
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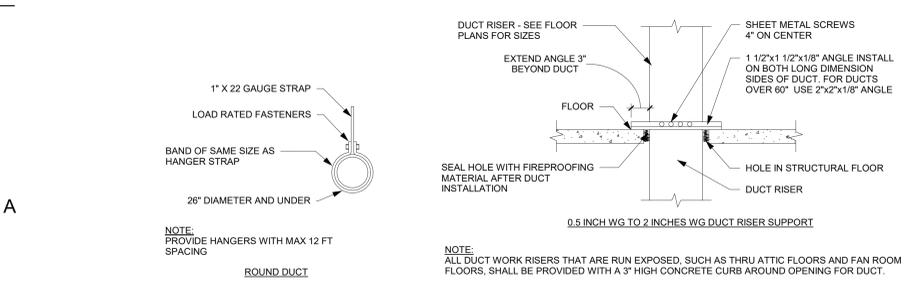
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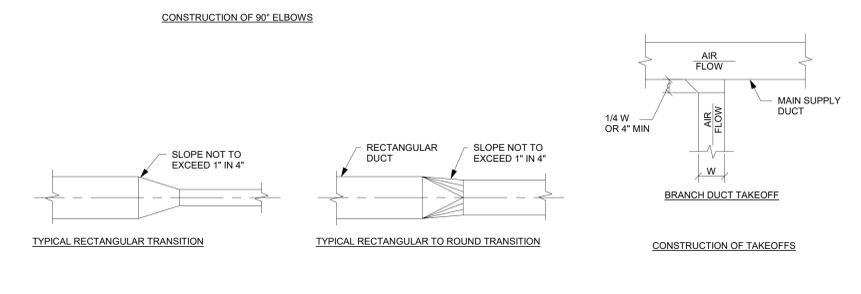
8 TYPICAL DUCT CONSTRUCTION DETAILS
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9 DUCT ROOF PENETRATION
SCALE: NOT TO SCALE



10 DUCT PENETRATION THROUGH NON-FIRE RATED WALL
SCALE: NOT TO SCALE



10 DUCT PENETRATION THROUGH NON-FIRE RATED WALL
SCALE: NOT TO SCALE

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PROJECT TITLE

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PROJECT ADDRESS

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YONKERS, NY 10701

OWNER

YONKERS PUBLIC SCHOOLS

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MEP ENGINEER AND ENVIRONMENTAL ENGINEER



SYOSSET, N.Y. 516-214-8157(T)

KEY PLAN: NOT TO SCALE

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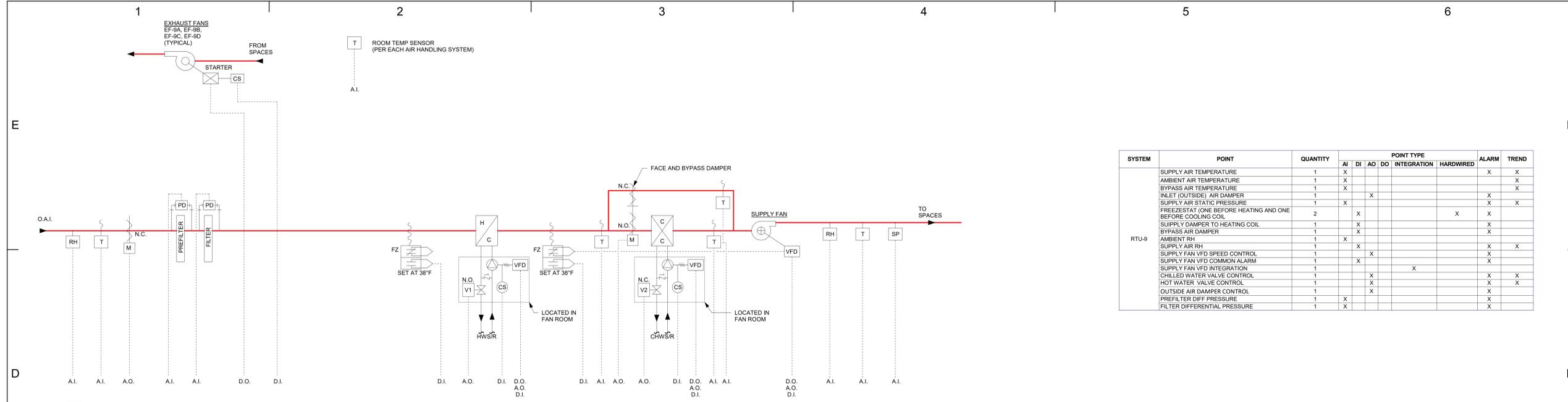
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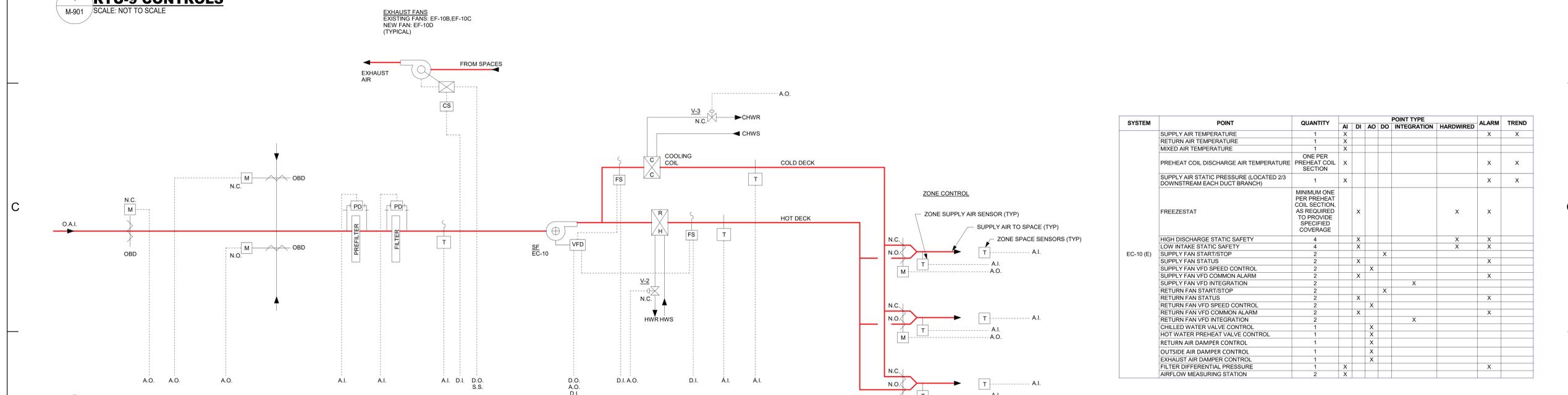
MECHANICAL CONTROLS

M-901



SYSTEM	POINT	QUANTITY	POINT TYPE						ALARM	TREND
			AI	DI	AO	DO	INTEGRATION	HARDWIRED		
RTU-9	SUPPLY AIR TEMPERATURE	1	X						X	X
	AMBIENT AIR TEMPERATURE	1	X							X
	BYPASS AIR TEMPERATURE	1	X							X
	INLET (OUTSIDE) AIR DAMPER	1			X				X	
	SUPPLY AIR STATIC PRESSURE	1	X						X	X
	FREEZESTAT (ONE BEFORE HEATING AND ONE BEFORE COOLING COIL)	2		X					X	
	SUPPLY DAMPER TO HEATING COIL	1	X					X		
	BYPASS AIR DAMPER	1	X						X	
	AMBIENT RH	1	X						X	X
	SUPPLY AIR RH	1	X						X	X
	SUPPLY FAN VFD SPEED CONTROL	1			X				X	
	SUPPLY FAN VFD COMMON ALARM	1			X				X	
	SUPPLY FAN VFD INTEGRATION	1				X				X
	CHILLED WATER VALVE CONTROL	1			X				X	X
	HOT WATER VALVE CONTROL	1			X				X	X
OUTSIDE AIR DAMPER CONTROL	1			X				X		
PREFILTER DIFF PRESSURE	1	X						X		
FILTER DIFFERENTIAL PRESSURE	1	X						X		

1 RTU-9 CONTROLS
M-901 SCALE: NOT TO SCALE



SYSTEM	POINT	QUANTITY	POINT TYPE						ALARM	TREND
			AI	DI	AO	DO	INTEGRATION	HARDWIRED		
EC-10 (E)	SUPPLY AIR TEMPERATURE	1	X						X	X
	RETURN AIR TEMPERATURE	1	X						X	X
	MIXED AIR TEMPERATURE	1	X							X
	PREHEAT COIL DISCHARGE AIR TEMPERATURE	ONE PER PREHEAT COIL SECTION	X						X	X
	SUPPLY AIR STATIC PRESSURE (LOCATED 2/3 DOWNSTREAM EACH DUCT BRANCH)	1	X						X	X
	FREEZESTAT	MINIMUM ONE PER PREHEAT COIL SECTION, AS REQUIRED TO PROVIDE SPECIFIED COVERAGE	X						X	X
	HIGH DISCHARGE STATIC SAFETY	4		X					X	X
	LOW INTAKE STATIC SAFETY	4		X					X	X
	SUPPLY FAN START/STOP	2			X					X
	SUPPLY FAN STATUS	2		X						X
	SUPPLY FAN VFD SPEED CONTROL	2		X						X
	SUPPLY FAN VFD COMMON ALARM	2		X						X
	SUPPLY FAN VFD INTEGRATION	2			X					X
	RETURN FAN START/STOP	2			X					X
	RETURN FAN STATUS	2		X						X
RETURN FAN VFD SPEED CONTROL	2		X						X	
RETURN FAN VFD COMMON ALARM	2		X						X	
RETURN FAN VFD INTEGRATION	2			X					X	
CHILLED WATER VALVE CONTROL	1			X					X	
HOT WATER PREHEAT VALVE CONTROL	1			X					X	
RETURN AIR DAMPER CONTROL	1		X						X	
OUTSIDE AIR DAMPER CONTROL	1		X						X	
EXHAUST AIR DAMPER CONTROL	1	X							X	
FILTER DIFFERENTIAL PRESSURE	1	X							X	
AIRFLOW MEASURING STATION	2	X							X	

2 EC-10 CONTROLS
M-901 SCALE: NOT TO SCALE



LEGEND

IDENTIFIER	DESCRIPTION
A.I.	ANALOG INPUT
A.O.	ANALOG OUTPUT
D.I.	DIGITAL INPUT
D.O.	DIGITAL OUTPUT
OBD	OPPOSED BLADE DAMPER
PH	PREHEAT
RH	REHEAT
S/S	START/STOP

3 UNIT VENTILATOR CONTROLS
M-901 SCALE: NOT TO SCALE

1. REFER TO SPECIFICATIONS 230993 FOR SEQUENCE OF OPERATIONS.

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